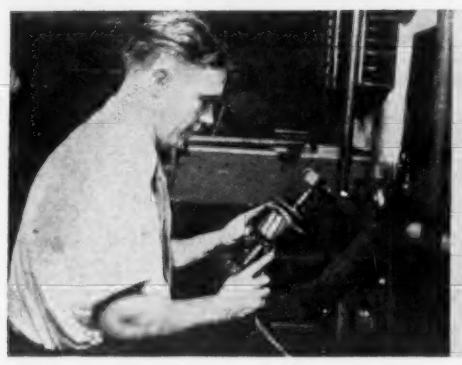
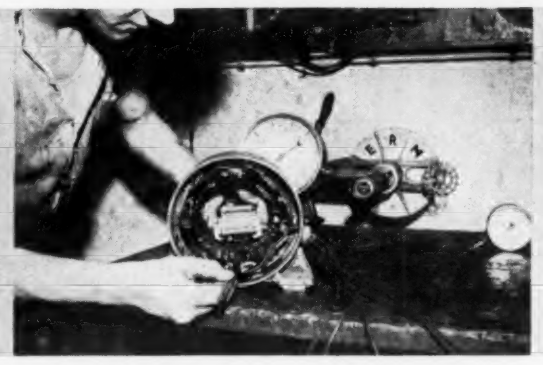
OPERATIONS IN THE REPAIR OF REFRIGERATION MOTORS

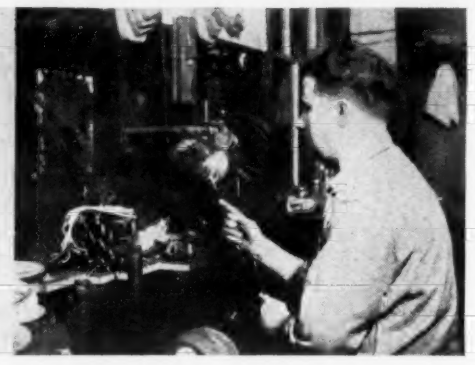


Winding refrigeration motor armatures.

Inserting new coils into the stator of a motor.



Stator test using an inside "growler."



Coil-winding machine to wind stator coils.

SERVICE

How Specialists in Motor Service Repair Refrigeration Motors

By George C. Tatem, Sales Manager
Electric Refrigeration Motor Co., Inc., Philadelphia

IT is quite obvious that during the past four or five years great strides have been made in the development of electric refrigeration, and while some subjects have received much publicity, little attention has been given to the most essential part of an electric refrigerator, namely the *electric motor*. It is from this unit which so much is expected, yet receives so little attention, and which to the distributor, dealer, ice cream company, etc., frequently governs whether or not their service departments will show a profit or deficit at the close of the year.

This is based not only on repair costs but on the incidentals in connection with a motor failure—which include a service man's time, the use of an automobile, and its maintenance, dissatisfied customers, and last but not least, either the replacements of certain food stuffs, if it happens to be a commercial job, or a suit for the recovery of spoiled merchandise.

Motor Sometimes Neglected

It is usually true that the service man sadly neglects this important unit. It should be impressed upon him that oiling and cleaning the motor may result in a substantial saving over a period of a year.

In a great many respects a motor is regarded like an automobile, and is only repaired after something has either broken or worn out, rather than being serviced every three or six months and at the first detection of an unusual condition.

If this were done, it would only be necessary to make minor repairs. On the other hand, if the unit is neglected it may need to be completely rebuilt, necessitating rewinding of both armature and stator and in most cases a new commutator.

Many Troubles Could Be Avoided

It is by far and large true that the largest expense in connection with servicing electric refrigerators can be directly attributed to the motor, and our experience over the past five years clearly indicates that at least 30 to 40 per cent of all motor repairs made by us could have been avoided if proper attention had been given the motor.

There is quite a deal more to the servicing and repairing of electric refrigeration motors than the average dealer, distributor, or ice cream company gives credit to, due to the fact that it is necessary to use expensive equipment in testing each individual part as well as giving a motor a thorough test after repairs have been completed.

Before a repaired motor is permitted to leave a shop it must have undergone all conditions which could be expected of it while operating in the field, as a one-year guarantee accompanies each motor after it is repaired.

To give a brief idea of a motor undergoing actual repairs, we are listing the steps through a shop specializing in this business.

(a) Motor received, tested and entirely disassembled. All parts washed with a safety solvent solution with the exception of course, of the armature and stator windings.

(b) Windings tested in both armature and stator. *Armature* is tested on a growler for a short circuit, a Neon tube is used to distinguish whether the armature is grounded or not.

The use of a Neon tube in connection with windings is probably the most perfect ground test that it is possible to give, inasmuch as a tube used for this purpose is so highly sensitive that it will show the slightest indications of moisture.

Milli-Volt Meter Test

A milli-volt meter which is cross-connected with a shunt coil, is used in testing an armature for a short circuit in each coil. In a great number of cases, this permits repairs to an armature which, if tested with ordinary equipment, would necessitate the rewinding of the unit, and possibly the installation of a new commutator. Armatures must be accurately balanced. *Stators* are tested with an inside growler.

(c) Checking bearings we liken to the sorters employed by carpet manufacturers in sorting the different grades or thickness of hair which may vary 1/50,000 of an inch, by hand. This, of course, only comes through experience. Without experience all bearings should be measured with a micrometer.

(d) All other parts should be likewise given a very thorough test. Springs should be given a weight tension test by instruments designed for this purpose.

Rewinding Armatures

We would also like to add a few words pertaining to the winding of armatures and stators. It is commonly known that a great deal of difficulty is encountered in the rewinding of an armature, a number of these units being shorted after being rewound.

This is due to many causes, the majority of which can be laid to inexperience. It is of the utmost importance that the double wires be laid into the laminations in such manner that they will not cross, otherwise they will rub through and a short circuit will develop. In some cases they even chafe while being rewound.

We use a hand needle for this purpose, which eliminates the possibility of crossed wires. Likewise the baking process has a great deal to do with the finished product, taking into consideration the Fahrenheit temperature of the ovens and the length of time being subjected to heat. In a great number of cases it is necessary to pregnate units before giving the final baking.

Assembly and Testing

The unit is then assembled after each individual part has been thoroughly tested. It is given a ground and insulation test, a Neon tube being used for this purpose. It is then placed on a test panel and given an actual load test, this test includes testing the motor for torque, r.p.m., amperes, wattage, heat, and running load test. The unit should then be refinished to make the appearance look as nearly like a new motor as is possible.

It might be well at this time to discuss general motor troubles which the average service man may encounter in the field, and a test which it is possible for him to make while on the job without the use of any special equipment. This is a diagnosis of electric motor troubles on repulsion-induction types:

Troubles Diagnosed

1. If the name plate is burnt or red in color, it is a good indication that the motor is burnt up.

2. *Check bearings* for up and down play, also side play. If you cannot feel any play in bearings this way, then pull out wick, take a flash light and light up oil well and move the shaft again. If there is any wear on bearings you will see the oil squeezing out the side of the shaft.

3. Sparking at brushes may be caused by a brush-holder that is off neutral. Try shifting brush-holder to top dead center where armature locks and will not rotate in either direction, then move brush-holder (with current off) one and a half bars towards direction of rotation.

Check brushes and see if they are parallel with commutator bars and not riding on two bars at the same time.

Check brushes to see if they are free in brush-holder. Check brush spring tension. Brushes may be worn down, which will cause sparking.

4. Check brush-holder for wobbling when motor is starting on repulsion. There are several things that may also cause a brush-holder to wobble: (a) worn brush-holder; (b) one or two brushes shorter than the rest; (c) governor weights push rods worn, or a commutator face may not be true.

5. Check for thrown solder. Check windings to see if they are burnt, charred, etc. by inserting fingers through inspection plate hole.

6. Shorted armature. Turn off switch, lift brush-holder and brushes off commutator, turn on switch. Remain holding brush-holder and brushes off commutator with left hand, revolve armature by pulley with right hand.

If armature will not turn, and has a tendency to lock, it is shorted. Do not confuse a dragging armature on the pole pieces where bearings are worn out with a shorted armature. If armature is not shorted it will revolve freely.

Finding a Shorted Stator

7. Shorted stator. (a) Lights will dim. (b) Correct size fuse will blow. (c) Start motor with compressor load on if armature comes up to speed and throws out brushes, off commutator, then the speed decreases again causing the brushes to go back on commutator.

This is a good indication of a shorted stator, but can not be relied upon entirely because the governor spring may be weak, or the short circuiting device may not be making good contact. If you run into a condition like this, try removing the short-circuiting device and governor spring and push rods.

Then: (a) Check push rods for wear, this will cause the trouble sometimes. (b) clean short-circuiting device or replace with new bracket. (c) Replace governor spring or stretch the old one a bit.

Rumbling in Motor

8. Excessive, uneven rumbling in motor. If bearings are o.k., disconnect motor from base, remove belt, then start motor. If it vibrates and shimmies off base, then the cause is: (a) armature out of balance or field coils with some turns left out of one or two coils, or (b) too many windings in some of the coils.

9. If motor does not come up to speed on start, take your watch and time the motor or count the number of seconds it takes for the motor on repulsion, then mark the brush-holder setting.

Move the brush-holder against rotation about ⅛ in. Check motor again to see if you have caused it to gain speed. If not, move brush-holder ⅛ in. from original brush-holder setting in direction of rotation and check again.

Shorts, or Worn Bearings

If no gain in speed is accomplished, check temperature of motor for heating up. If it is found to be heating and you are sure the compressor is o.k., there is a possibility that either the armature or stator is shorted, or that the bearings are worn.

10. Always test each lead for a circuit, individually.

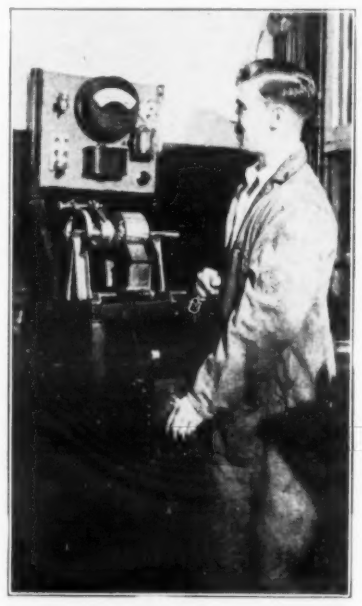
11. Grounded stator. Unless a ground is bad here it will not show up on 110 volts.

12. Grounded armature. To test remove from stator take off brush-holder and pull out short circuiting device.

13. If excessive brush wear is experienced, check the armature for an open circuit.

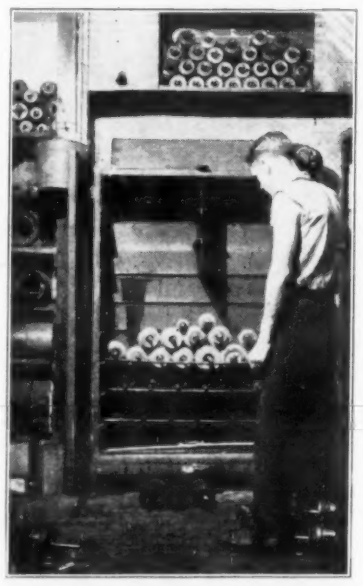
In summing up, it would be possible for us to write a great deal about incidentals in connection with motor repair work, and we have therefore endeavored to be as brief as possible in bringing out the high spots which we believe would be most beneficial.

'Growler' Test



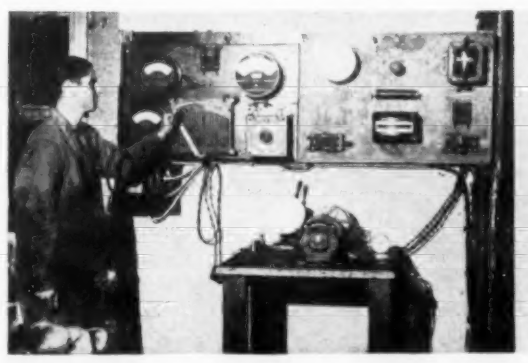
Combination armature and commutator growler test, showing neon tube and milli-volt test meter.

Electric Oven

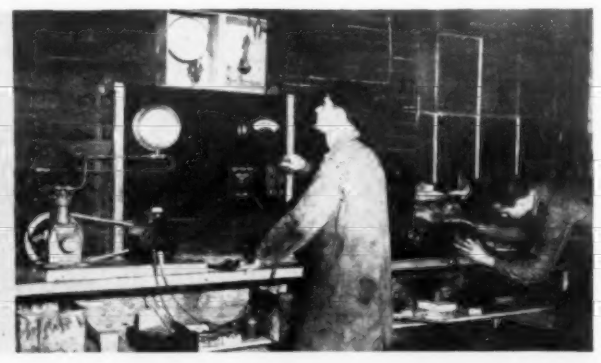


Drying armatures of refrigeration motors in an electric bake oven.

Testing the Finished Product



Test panel where torque, wattage, and current consumption are measured.



Equipment for running a load test on a motor rebuilt by Electric Refrigeration Motor Co.

THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

WRITTEN TO BE READ ON ARRIVAL

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MAJESTIC LIVING UP TO NRA CODE, GRIGSBY CLAIMS

Answers Criticism of Policies by Labor Newspapers

CHICAGO—Answering an article which appeared recently in "labor" newspapers stating that the Grigsby-Grunow Co. here was paying wages below NRA levels and that the company was "in a jam" with the recovery administration, B. J. Grigsby, president, last week issued the following statement to members of his distributing organization:

"This company has had very friendly relations with union labor in Chicago, with the exception of one local (machinists), whose leaders would not play fair with the company.

"The controversy occurred in 1930, but their abuse has continued from time to time, in the hope of forcing a change in our stand, which was declared fair at the time by the representative of the American Federation of Labor at Washington.

"Heads of other local unions—Carpeners & Millwrights, and Electrical Workers—attested our friendly relations with union labor by letters which are in our files and copies of which will be furnished our dealers on request.

"With reference to the allegations concerning 'chiseling wages' and being 'in a jam with NRA,' the following are the facts:

"1. We were one of the first manufacturers, and we believe we were the first radio and refrigeration manufacturer, to telegraph the President, following his radio broadcast, of our desire to follow his leadership by accepting his code.

"2. Grigsby-Grunow Co. signed the President's code on Aug. 2, 1933; again,

(*Concluded on Page 12, Column 5*)

PRICE FIXING CLAUSE OUT OF RETAIL STORE CODE

WASHINGTON, D. C.—Price fixing for retail stores—an issue that had delayed for weeks the signing of a general retail code—was ruled out officially Oct. 13 by the National Recovery Administration.

The provision of the code that has been thrown out was one which would have made a minimum mark-up of 10 per cent mandatory on goods sold by all retailers.

However, a provision is to be written into the code which will prohibit selling below "invoice cost." This means that retailers, if the code goes into effect, cannot lawfully sell merchandise below cost to attract customers.

Those favoring the price control section of the codes said that the whole purpose of the relief legislation is to prevent destructive competition. Some formula for preventing the use of "loss leaders"—the sale of certain articles at or below cost to attract customers—is considered necessary by this group.

Those opposing the price control provisions, including the Consumers' Advisory Board, contended that they would operate as a shield to protect profiteering. They argued that prices could be marked up arbitrarily and that the excuse for increases would be the code provision on prices.

Former Copeland Men Get New Jobs

MT. CLEMENS, Mich.—Several men formerly connected with Copeland Products, Inc., of this city have resigned from that organization, according to reports from the factory.

O. G. Lonsky has resigned as Copeland's purchasing agent to become secretary-treasurer of Automobile Shippers, Inc., Detroit. He had been with Copeland since 1926, and before that time was with Chrysler Corp.

George Licence has resigned from the service managership at Copeland, and will start work with Stewart-Warner Corp. Nov. 1. Charles W. Hadden, formerly sales manager, has also resigned and before beginning other work will take a vacation in Florida.

$743,018 Spent in Magazines During First 6 Months

During the first six months of 1933 the electric refrigeration industry expended $743,018 for advertising space in leading national magazines according to reports compiled by the Curtis Publishing Co. Appropriations for space in the *Saturday Evening Post* amounted to $306,205, or approximately 41 per cent of the total, while placements in the *Ladies' Home Journal* totaled $68,922, or 9 per cent. At the present time a listing of advertising expenditures by individual companies for 1933 is not yet available.

A review of electric refrigeration advertising over the five years 1928-1932 shows that $11,199,268 was spent by the industry during that period. General Electric Co. led all other manufacturers of electric refrigeration in advertising expenditures investing $4,131,277, or about 37 per cent of the total five-year disbursement, while Frigidaire Corp. accounted for $3,645,951, or nearly 33 per cent.

Among the publications the *Saturday Evening Post* carried the largest amount of electric refrigeration advertising, placements in that periodical amounting to $4,115,038, or 37 per cent of the total expended during the five-year period. A total of $1,300,823, or nearly 12 per cent, was appropriated to *Good Housekeeping*, while advertising in the *Ladies' Home Journal* amounted to $1,280,906, or about 11 per cent.

The amounts spent by electric refrigeration advertisers and the publications used over the five-year period appear on page 10.

HOYT DISCUSSES REFRIGERATION OF TRUCK BODIES

Solid CO-2, Salt & Ice, Mechanical Units Described

LOS ANGELES—Construction of refrigerated trucks and methods of refrigeration used in the transportation of perishables today were the subjects discussed by H. M. Hoyt of Drayer-Hanson, Inc., when he addressed the October meeting of the Los Angeles section of the American Society of Refrigerating Engineers.

"Two questions generally enter the mind of the prospective user of refrigerated trucks—weight and cost—and of these, weight is usually the more important," said Mr. Hoyt.

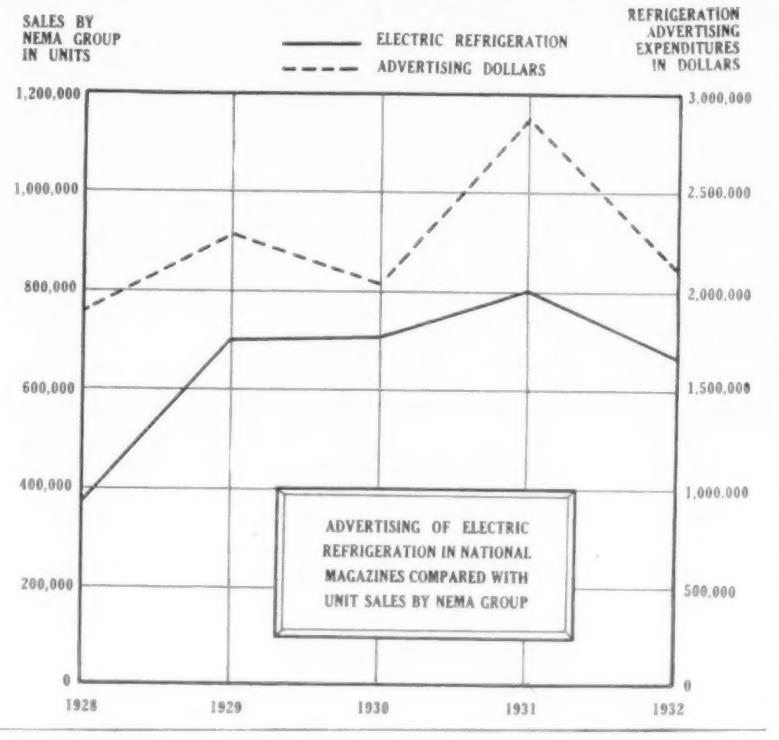
"Maximum allowable loads in this territory are 22,000 lbs. on four wheels, and 34,000 lbs. on six wheels. Therefore, weights must be kept low.

"Oak frames are generally used in body construction, but dualamin will eventually pay for its own extra cost. By far the most common insulant for refrigerated trucks is Dry-Zero, which is installed between layers of special paper, and is sealed in. Care used in installing insulation is a direct means of determining its life."

Truck bodies, said Mr. Hoyt, are

(*Concluded on Page 9, Column 3*)

Relation of Advertising to Nema Sales



Analysis of Advertising Expenditures Of Leading Manufacturers

Advertiser	1928	1929	1930	1931	1932	Company Totals
General Electric Co.	789,567 (40.9%)	931,145 (40.8%)	*981,099 (48.4%)	*950,610 (32.9%)	478,856 (22.8%)	4,131,277 (36.9%)
Frigidaire Corp.	784,566 (40.7%)	*992,319 (43.4%)	*619,881 (30.5%)	*761,135 (26.4%)	488,050 (23.3%)	3,645,951 (32.5%)
Kelvinator Corp.	89,520 (4.7%)	*181,161 (7.9%)	237,609 (11.7%)	*302,900 (10.6%)	248,200 (11.9%)	1,059,390 (9.5%)
Westinghouse Electric & Mfg. Co.	....	....	....	322,900 (11.2%)	308,575 (14.8%)	631,475 (5.6%)
Electric Refrigeration Bureau	....	....	....	179,700 (6.2%)	141,521 (6.7%)	321,221 (2.9%)
Leonard Refrigerator Co.	60,600 (3.2%)	83,050 (3.6%)	50,265 (2.5%)	76,556 (2.7%)	46,000 (2.2%)	316,471 (2.9%)
Norge Corp.	....	....	....	125,450 (4.3%)	143,200 (6.8%)	268,650 (2.4%)
Copeland Products, Inc.	$ 65,843 (3.4%)	$ 32,000 (1.4%)	$ 51,000 (2.5%)	$ 32,000 (1.1%)	$ 48,274 (2.3%)	$ 229,117 (2.0%)
Servel, Inc.	67,400 (3.5%)	....	23,000 (1.1%)	80,500 (2.8%)	54,400 (2.6%)	225,300 (2.0%)
Grigsby-Grunow Co.	....	....	55,200 (2.7%)	32,050 (1.1%)	56,000 (2.7%)	143,250 (1.3%)
Gibson Refrigerator Co.	42,772 (2.2%)	30,053 (1.3%)	....	....	25,400 (1.2%)	98,225 (0.9%)
Crosley Radio Corp.	2,700 (1.4%)	37,239 (1.6%)	12,173 (0.6%)	....	15,874 (0.8%)	67,986 (0.6%)
Trupar Mfg. Co.	....	....	....	21,705 (0.7%)	39,250 (1.9%)	60,955 (0.5%)
YEARLY TOTALS	$1,902,963 (100.0%)	$2,286,967 (100.0%)	$2,030,227 (100.0%)	$2,885,500 (100.0%)	$2,093,600 (100.0%)	$11,199,268 (100.0%)

*Includes water cooler advertising expenditures.

New Thermostatic Valve Designed By Fedders

(*See Sectional Drawing on Page 9*)

BUFFALO — Fedders Mfg. Co. has just announced a new thermostatic expansion valve model 33 with a removable power element, capillary tube and bulb, according to W. D. Keefe, sales manager of Fedders' electric refrigeration division.

The interchangeable power element, capillary tube and bulb assembly is readily removable from the valve proper, so that field stocks can be minimized by stocking only a number of power elements for each different refrigerant used with the valve, Mr. Keefe points out. It also permits substitution of a new power element for an old one operating in the field without removing the valve from the evaporator.

Another new feature of the valve is the addition of an internal stop in the power bellows which makes it possible to ship and handle the bellows and tube assembly without the "cage" which has heretofore been used to prevent excessive expansion of the bellows at non-refrigerated temperatures.

The valve is sealed against the entrance of moisture from the exterior, Mr. Keefe declares, and has been tested for several months under water without moisture entering the interior mechanism.

Adjustment is made on a thumb nut without disturbing the threads and moisture-sealing gaskets of the power element housing. The valve adjustment

(*Concluded on Page 9, Column 4*)

G-E OFFERS TENANTS AIR CONDITIONERS

NEW YORK CITY—Installation of cabinet units for year-'round air-conditioning of G-E executive offices in the General Electric building has been completed, and the management is informing prospective tenants that their offices will be equipped with air conditioning if desired.

Besides all executive offices on the top five floors of the 47-story building, some offices on the fourteenth, sixteenth, and nineteenth floors, and the eleventh floor reception room are air-conditioned.

In the latter room, a portable room cooler is used; in one office an integral-type all-year conditioning unit is employed. All other offices, however, are equipped with cabinet units connected in multiple to remotely installed compressors.

Basing their calculations for required refrigeration upon a 13½° temperature difference—78½° F. inside, 92° outside—G-E engineers estimated that 13.6 tons of refrigeration would be needed, but installed equipment capable of supplying 17.6 tons.

Each of the cabinet units has five tiers of extended surface coils, the two upper tiers for heating purposes, the three lower banks for cooling. A fan below the coils forces air over the surfaces, while another brings outside air through a filter and silencer, then blows it into the room.

The ventilating fan in each cabinet can be set to supply 200 c.f.m., or 100 c.f.m, or can be shut off entirely. When the latter is done, the fan beneath the cooling and heating coils recirculates room air at a maximum of 200 c.f.m. Humidimer in each units is of the heat immersion type, and is manually controlled.

Each unit has steam supply and return connections, a refrigerant liquid and suction connection, drain connection, 120-volt single-phase power con-

(*Concluded on Page 12, Column 5*)

G-E Sales Promotion Men Meet Oct. 23

CLEVELAND—Sales promotion managers of General Electric distributorships will meet at General Electric Co.'s specialty appliance sales department headquarters here Oct. 23 and 24 for their annual conference on problems in their field.

For the most part, the conference will be held forum fashion, although a few addresses will be made on scheduled topics, according to Walter J. Daily, manager of the department's sales promotion division.

IMPLICATIONS OF NRA DISCUSSED BY RUTHENBURG

Cold Storage Practices Discussed by Oakley, A.S.R.E. by Fiske

By Elston D. Herron

DETROIT—When the Detroit A.S.R.E. held its October meeting in the Book-Cadillac hotel here Monday night, its members heard a program somewhat different from the usual card of speeches made at gatherings of engineers.

First came an informal but authoritative discussion of the NRA by Louis Ruthenburg, consultant to the refrigeration division of National Electrical Manufacturers Association.

Then an outline of modern warehouse practices by A. W. Oakley, national A.S.R.E. president, and finally, a talk on associations in general—and A.S.R.E. in particular—by D. L. Fiske, national secretary of the society.

After the A.S.R.E. meeting in Detroit, Messrs. Oakley and Fiske will travel to Chicago, Milwaukee, and St. Louis for A.S.R.E. monthly meetings there.

In his address, Mr. Ruthenburg dwelt mainly upon the economic, psychological, and social implications of the NRA, and pointed out the relative importance of the recovery act in the country's general economic trend.

"The NRA has come with a great suddenness," he said, "but it would have come eventually anyhow. Today's tendencies in business are merely a part of a regular evolution.

"First there came a period of unrestrained competition in this country's business. Then arose a clamor for control which resulted in anti-trust laws. Of course there were reactions in the opposite direction at intervals, but this steady evolution continued its progress until it resulted in the NRA."

Recalling the chaos of early 1933's closed-bank period, Mr. Ruthenburg pointed out why the NRA finally materialized with such amazing speed. He said this:

"With the banks closed, we wanted

(*Concluded on Page 12, Column 1*)

CAMPBELL BUILDS CABINET HUMIDIFIER, AIR WASHER

NEW YORK CITY—New product in the line of air-conditioning equipment manufactured by Campbell Metal Window Corp. here is a cabinet-type humidifier and air washer, sale of which will receive special promotion by Campbell dealers during the winter months.

From the motor-driven fan in this unit comes a stream of air which rotates a series of filters, which are moistened, as they rotate, from the water reservoir in the cabinet, explain Campbell engineers.

The air stream then passes through the filters and during the process is rid of its impurities and supplied with sufficient moisture to increase the room's humidity.

Air is washed and humidified by the new units at the rate of 12,000 cu. ft. per hr., according to the engineers, who say that during a 24-hr. period, three gals. of water are evaporated into the air by the conditioner.

Production of this new humidifier-washer is in line with the manufacturer's policy of supplying its dealers with several units which perform only one or two (but varied) functions of air-conditioning—each unit intended for special sales promotion effort at a particular season of the year.

This enables dealers, Campbell of-

(*Concluded on Page 10, Column 1*)

BUREAU EXTENDS ENTRY DATE TO NOV. 7

NEW YORK CITY—With Electric Refrigeration Week past, the Electric Refrigeration Bureau here is notifying all local bureaus and similar organizations which sponsored expositions the first week of October that they are still eligible to enter the national bureau's contest for best expositions. Entries will be accepted up to and including Nov. 7.

BY GEORGE F. TAUBENECK - - -

Death in Mid-Air

When the three-miles-a-minute Boeing low-wing monoplane flying between New York and Chicago exploded near Chesterton, Ind., Oct. 10, a couple of swell fellows were snuffed out in mid-air.

One was C. F. SCHENDORF, who managed apartment house sales for R. COOPER, JR., Chicago G-E distributor.

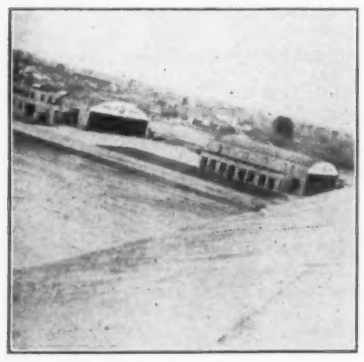
Another was co-pilot HARRY RUBY, who was a college mate of the writer, and a friend of JACK SCHAEFER and PHIL REDEKER of our editorial staff.

Cause of this tragedy may never be known. Like most other airplane crashes, the remains of the giant airliner were in no condition for study to determine the flaw.

That it was a remarkable airplane, however, this writer will be glad to testify. Two days before the crack-up, we rode this plane from New York to Chicago.

Powered by two 550 hp. Pratt & Whitney (whose machine tools are

Fast Takeoff



The Boeing makes a fast take-off from the Cleveland airport.

used by most refrigerator manufacturers) Wasp engines, the plane takes off like a skyrocket, dropping the earth beneath it like a proverbial plumet.

It's one plane in which you feel the sensation of moving. Look downward, and the fields and hills and villages beneath you are passing swiftly in review.

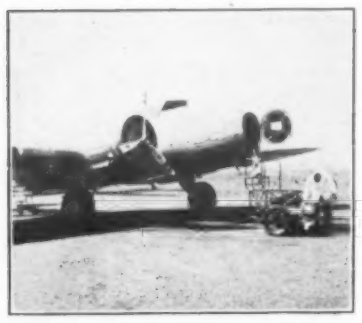
It's all very thrilling at first, but after about an hour of bumping over the Alleghenies at such terrific speed, many of us began to suffer a little *mal de mer*.

Luncheon was served by the stewardess (these air hostesses are a fine breed—strong, clean, courageous, often witty, generally good looking) shortly before we dropped down on Cleveland. That was an unmitigated waste as far as about half of the ten passengers were concerned.

Advertised as a 4¾-hour trip, the New York-Chicago journey took us a little more than five hours. That's speed, gentlemen. Cost is just under 50 dollars. (One must count also taxis from airports to downtown. A Cadillac V-16 transported us from the Hotel Pennsylvania in New York to the Newark airport for 75 cents.)

We had to make a reservation for one of the Saturday planes on Thursday. Every one was loaded when it took off.

Rapid Transit



Here is the Boeing monoplane which goes from New York to Chicago at 3-mile-a-minute speed.

People

Although a Detroiter, we'd never met ORLIN JOHNSON, the mechanic who accompanies GAR WOOD in all his speedboat races, until TREV PEIRCE, Majestic distributor in Philadelphia, introduced us in that city. He's a little, modest, good-humored man you'd like at once.

In Muskegon HERB MORLEY, *distingue* plant manager for Norge, introduced us to the fine-looking father of BENNIE OOSTERBAAN, three times an All-American end from Michigan, and undoubtedly the greatest pass receiver of all time.

Traveled from Detroit to Philadelphia with R. I. PETRIE, new Kelvinator sales manager, and BEN ROWE, veteran and wise Leonard district sales manager.

Mr. Petrie, who has been Leonard sales manager, is a Leonard man in the morning, Kelvinator in the afternoon. That's difficult, too, for despite the fact that both machines are made by the same factory, and are practically identical, the sales organizations are as much rivals as Frigidaire and General Electric.

Mr. Petrie predicts an era of free spending, beginning soon.

Had a pleasant evening—including a swim in the high-hat Racquet Club—with CHARLES D'OLIVE, manager of Stewart-Warner's up-and-coming new refrigeration department, L. W. ENOS, his well-bred New England district representative, and the latter's brother, R. C. ENOS, a Curtis Publishing Co. man.

You can't spend much time around those fellows, or with general sales manager F. A. HITER, without becoming convinced that Stewart-Warner is going places next year.

Took J. K. RICH of the Blackett-Sample-Hummert advertising agency for a ride in the Yellow Peril, and he was duly impressed — although he talked so much about the strength and potentialities and fine personal qualities of the new Stewart-Warner management that he couldn't have spent much time observing the performance of our beloved speedster.

Spent some time another night with H. W. GIFFORD, aggressive and highly successful young vice president and retail sales manager for R. COOPER JR., and with ambassadorial LES SHOLTY, Chicago man for LOU MAXON'S advertising agency.

On the Chicago-Muskegon trip with the Norge Viking Club we again had the opportunity to witness the tremendous vitality and staying powers of Vice President in Charge of Sales JOHN KNAPP.

Johnny played hard, fraternized with the boys like a brother, and then had enough left to talk earnestly, sincerely, and almost passionately for more than two hours on the subject of new distribution methods with your favorite correspondent. The talk, incidentally, began about 4:00 a. m., and ended at 6:20 when the train rolled into Muskegon!

Also had the opportunity to learn again how much we liked and appreciated the fine character of R. E. DENSMORE, Norge Western manager, and W. C. ROWLES, Southwestern divisional manager.

Talked at some length with old-friend A. H. BOTTENFELD, formerly of the Cleveland distributorship but now in St. Louis, with A. H. and PHIL CROWE of the St. Louis distributorship (Phil went home with our prospective new fall suit in his pocket as a result of his uncanny marksmanship with the dotted-not-ice-cubes), with SUE MIDDLETON, the charming Kansas City girl who is said to have sold 170 refrigerators to domestic customers this year, and with any number of other interesting people.

Out at the Pabst Blue Ribbon Casino, where popular BUDDY ROGERS, funny JACK DOUGLAS, and pretty JEANNE GOODNER entertain mobs of beer-drinking visitors to the World's Fair, they have discovered a new problem:

What can be done about lipstick?

Beer loses sparkle and foam with the slightest amount of grease on the glass container. So much lipstick appeared on glasses served out there, and it was so hard to get off, that a special method of cleaning had to be devised.

EARL McCALL, night janitor at the Kelvinator exhibit was disturbed over the number of lovers collecting in the booth after the lights were turned out for the day. There they found the seats comfortable and the darkness convenient.

Earl is not opposed to romance; but the visitors' feet impeded the progress of his vacuum cleaner. So he devised a simple scheme.

At the far end of the row, he now starts his cleaner, and with a great clatter and racket turned over each chair as he reaches it. The seats are vacated rapidly.

Most of the water coolers on the grounds require a penny for a drink. The other day JIMMY O'NEIL saw a spare old man drop a coin into a Kelvinator cup holder, get a cup, and take a drink.

When the penny fell to the floor, the visitor looked furtively around, picked it up, put it in the cup holder again, and took another drink.

Three drinks he had; and when the coin fell out the fourth time, the old man put it in his pocket, walking away with an expression of financial satisfaction on his face.

JACOB OLKEN, Westinghouse commercial salesman in Chicago, promoted a romance not long ago, and as a result sold a Westinghouse AS-50 commercial unit to a vegetable store.

For several weeks, Olken had been trying to make the sale to HYMAN DONIGER, proprietor of the Lawrence Ave. market, and was making almost no headway.

Then Doniger's son LEO saw pretty ESTELLE OLKEN, daughter of the salesman. There was a short whispered conference between Son Leo and Salesman Olken. Result: Leo and Estelle saw a movie a night or two later.

Within a few more days, the condensing unit was installed in the Doniger market and the son-and-daughter duo was visiting other cinema houses. Now, Leo and Estelle are buying furniture and deciding what model of refrigerator to put in their soon-to-be-built home.

* * *

Ilg at the Fair

Ilg is making great capital of its participation in A Century of Progress.

In an excellent window display on La Salle St., a display typical of Ilg advertising this summer, are placards with the following:

Ilg—Over a quarter century of progress in air conditioning.

Graybar Ilg Kold—Does its own remembering. No dials to set. Automatic freezing control.

World's Fair exhibits equipped with Ilg ventilation and cooling—Kraft-Phenix Cheese Co., Household Finance Corp., General American Tank Car Co., Polish Bldg., Weil-McLain Co., International Business Machine Co., Walgreen Bldg. (23rd St. Plaza), Sears Roebuck Bldg., Mayflower Donut Shop, Standard Oil Co. (Ind.), Triangle Restaurant (Hall of Science), Union Carbide & Carbon Co., Rutledge Tavern, Brick Manufacturers Association House, Masonite House, National Lumber Manufacturers Association House, Old Heidelberg, Walgreen Store (Hall of Science), N & C Italian Restaurant, Peabody Coal Co., Stayform Co.

* * *

Super-Powered Norge

The film, "Double Harness," with ANN HARDING and WILLIAM POWELL, centers one scene (in Miss Harding's home) around a G-E Monitor Top, and another scene near a super-series Frigidaire—a big, two-door model.

Another picture, "Corruption," is all about a series of mysterious deaths which are caused, it is finally unravelled, by ice bullets.

Poison was frozen into these ice bullets, they were shot from guns, and after entering the body they melted, releasing the poison and killing victim. Autopsies were always puzzling, because no bullets could be found.

In one scene a drunk stumbles into the laboratory of the ice-bullet inventor. And there you see what is unmistakeably one of the styled 1933 Norge boxes. Inside the Norge the drunk finds a carton of ice bullets.

"How can you be sure," he queries the inventor, with a perception surprising in one so tipsy, "that your bullets won't melt a little bit and not be true to the gun bore?"

"Oh," said the inventor, "that's easy. The refrigerator you see is a super-powered job—not like ordinary refrigerators—and keeps the bullets at extremely low temperatures. There's no **danger!"**

* * *

'Way Back When

JIM STERLING tells us that he has still another stunt up his sleeve. It's a dandy too.

Capitalizing the human desire to look at photographs of other days, Norge will introduce a series of window posters built around the theme that if Norge had been bought "way back when," it would still be giving good refrigeration.

Quaint photographs of 1906 events are being used, such as a photograph taken at the wedding of ALICE ROOSEVELT and NICHOLAS LONGWORTH at the White House, in which the bridal party is posed with TEDDY ROOSEVELT, then president.

These views are issued in current events pictorial form, the picture appearing inside an open-doored Norge with copy overprinted on cabinet base. Tests show that these posters often treble the stopping value of a window, Jim maintains.

* * *

Executives

F. M. COCKRELL cried, "Hear! Hear!" when he read this piece in *Red Book* by F. F. BEIRNE. If you're an executive, you may too. Here tis:

"Executives are a fortunate lot. For as everybody in an office knows, an executive has nothing to do. That is, except:

"To decide what is to be done; to tell somebody to do it; to listen to reasons why it should not be done, why it should be done by somebody else, or why it should be done in a different way, and to prepare arguments in rebuttal that shall be convincing and conclusive—

"To follow up to see if the thing has been done; to discover that it has not been done; to inquire why it has not been done; to listen to excuses from the person who should have done it and did not do it; and to think up arguments to overcome the excuses—

"To follow up a second time to see if the thing has been done; to discover that it has been done but done incorrectly; to point out how it should have been done; to conclude that as long as it has been done, it may as well be left as it is.

"To wonder if it is not time to get rid of a person who cannot do a thing correctly; to reflect that the person in fault has a wife and seven children, and that certainly no other executive in the world would put up with him for a moment; and that, in all probability, any successor would be just as bad or worse—

"To consider how much simpler and better the thing would have been done had he done it himself in the first place; to reflect sadly that if he had done it himself he would have been able to do it right in 20 minutes, but that as things turned out he himself spent two days trying to find out why it was that it had taken somebody else three weeks to do it wrong.

"But to realize that such an idea would have had a highly demoralizing effect on the organization, because it would strike at the very foundation of the belief of all employes that an executive has really nothing to do."

* * *

Tha Winnah!

Miss Mary Emily Jacks, representing the Boren Bicycle Co., Crosley dealer of Little Rock, won a recent beauty contest.

'Can't We Talk It Over?'

W. G. Harveycutter, Kelvinator commercial district manager in Mississippi, Tennessee, and Kansas, smokes an after-dinner cigar while John Garceau, Kelvinator sales promotion man, pats him on the back.

Effective Window And Floor Displays

W. G. BROWN, L. C. HEISS, and V. T. NAST of Philadelphia, R. M. ANGELL of Albany, H. C. CANNON of Brooklyn, and DAVID CONGRESS of Far Rockaway are members of the American Gas Association committee on display advertising. A digest of their research and opinions, as presented to the Publicity and Advertising Section of the A.G.A., should prove useful to many readers:

"First qualification of a display is that it attract attention. If it does not do this any other good points it may have are wasted. Numberless ways may be used to achieve this result. It may be form, color, design, or even size; but unless it be effective use of space, size alone will not help much.

"Next, a display must be pleasing and interesting. Human desires and their satisfactions form the fundamentals upon which all selling and displays should be based.

"Once your display has attracted the attention of the beholder, it must arouse instantaneous interest in his mind. It must awaken some desire for possession.

"Displays should be timely. The display director should always be on the lookout for sudden changes that may give added impetus to any article. These changes may be weather conditions, holidays, rival advertising, or anything timely in which the customer may be most concerned.

"The composition must be informative. It should tell some specific fact that is important or outstanding. It should be forceful, and straight-to-the-point in way of copy. Price or payment is always an important factor.

"A display should be consistent with the merchandise. This holds true in design, and also, to a great extent, in color.

"Good taste must always be observed. When you are dealing with a great mass of humanity, care must be taken not to offend anyone.

"It is absolutely essential that display advertising be truthful. You are dealing with facts. If through some oversight or error discrepancies creep in, be prompt to correct them. Your customer will appreciate it.

"There must be effective departmental cooperation. The display must tie in with newspaper advertising, and the salespeople must be thoroughly familiar with the article offered and advertised, and be ready to give immediate assistance to interested customers.

"Good lighting is absolutely essential for all displays, whether for show window or floor. Too much economy here does not pay. By good lighting is meant proper lighting, not necessarily bright lighting. If a certain composition calls for subdued or colored illumination, don't hesitate to use it.

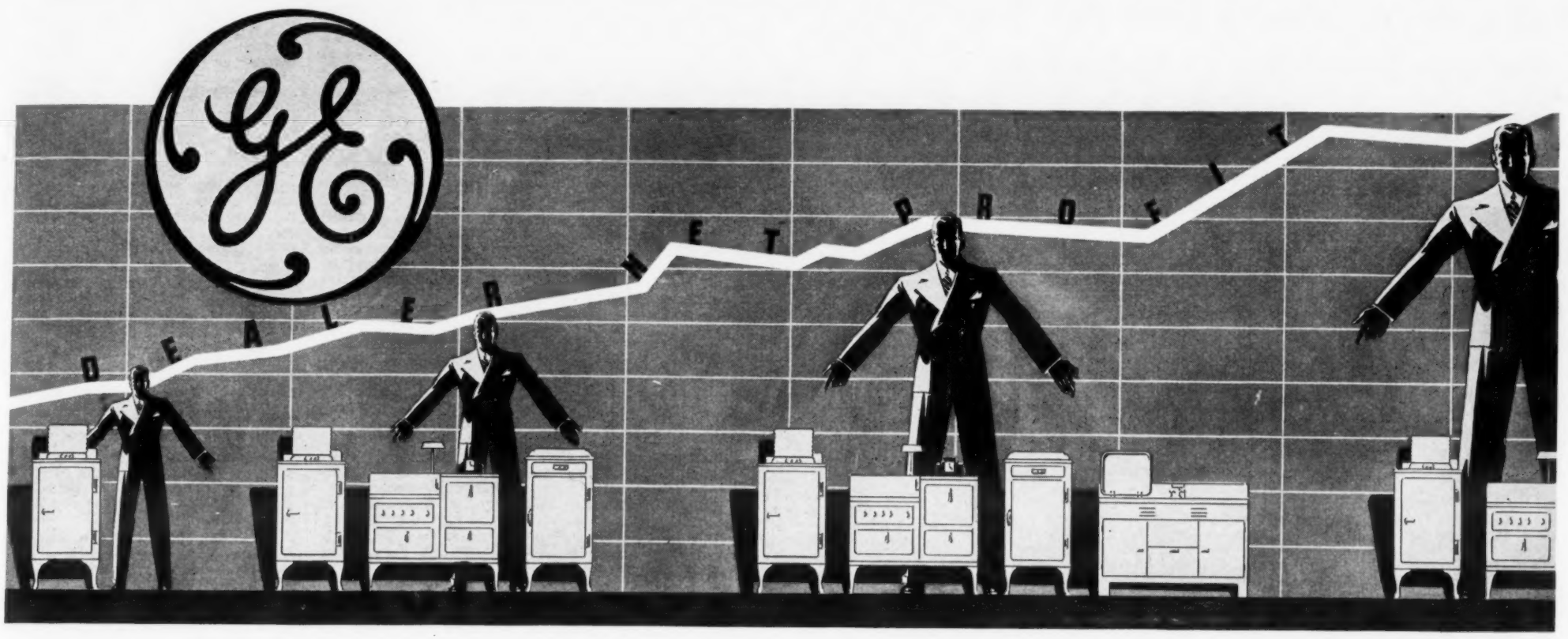
"Cleanliness is highly important. Dust or carelessly cleaned articles detract and kill the value of a display immediately.

"Several mistakes that may be corrected with a bit of care include:

"Attempting to crowd too much merchandise into the picture.

"Combining unrelated goods in a way to produce meaningless effects.

"Using poor artistic taste in line, color, or form."



you can GROW

with a GENERAL ELECTRIC franchise

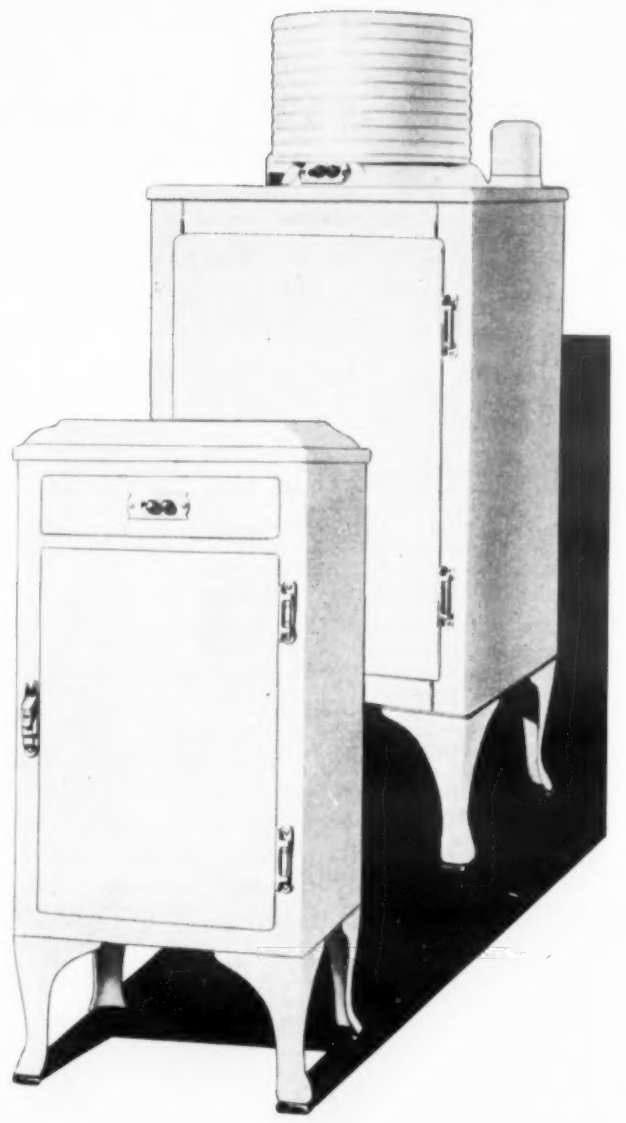
A refrigerator sale is only the beginning!

•

Whether a one-unit outlet or a carload operation—there's a General Electric dealer plan to fit every individual requirement. No matter how small or large your display facilities may be, if you measure up to G-E standards, there is a profitable, growing business waiting for you. General Electric is now appointing new dealers in open territories. Write or wire for details.

A GENERAL ELECTRIC refrigerator dealer can sell to the same customer *over and over again*. His sales possibilities are not confined just to refrigerators. He has the opportunity of selling G-E Ranges, G-E Dishwashers, complete General Electric Kitchens—the entire line of G-E specialty appliances. From a small beginning it is possible for him to build a permanent business. His is not merely a dealership—it is a *business* that operates throughout every season of the year—it is continuous, it is permanent, and has every opportunity to grow.

General Electric refrigerators have long been recognized as the standard of refrigeration excellence. The G-E monogram on any General Electric home appliance is a potent sales influence. Universally accepted as a mark of quality and value, it brings to the G-E refrigerator dealer additional electric home appliance business in his territory. A refrigerator sale need be—and should be—only the beginning! General Electric Company, Specialty Appliance Sales Department, Section DF102, Nela Park, Cleveland, Ohio.



GENERAL ELECTRIC

REFRIGERATORS • RANGES • DISHWASHERS

Refrigeration Industry Need Not Fear Business Revolution - - Ruthenburg

By Louis Ruthenburg,* Consultant to Refrigeration Division of National Electrical Manufacturers Association

American business is not approaching revolution. It is not about to be revolutionized. We are *living today* in the early phases of drastic and far-reaching revolution.

If any of us think of the "New Deal" as being temporary and plan for a future that shall resemble anything we have known in the past, we are sadly lacking in perspective. We are wasting precious time and effort that should be devoted to thinking and planning in terms of radically new business conditions.

Conditions imposed by the National Recovery Act represent the explosive culmination of a long series of changes in the attitude of the American public toward American industry; the detonating force having been supplied by world-wide depression.

Dictated by Circumstances

As to the latter, I quote a significant statement made by F. H. Figsby, partner of Ernst & Ernst:

"In this connection, it is pertinent to observe that the regimentation of industry is going forward under compulsion of circumstances in countries which are essentially radical (mainly Russia); in countries which are patently socialistic (Germany, England, France); in countries where political dictatorship idea is dominant (Italy, Germany); and in the one country which is more essentially conservative than all others (United States).

"The obvious conclusion is that forces of economic and social circumstances are dictating these new alignments and organizations of trade and industry, and that political force and varying political ideas are merely the instrumentalities through which the reforms are being effected. The point in this observation is that business men who are being disturbed and shaken by the new order of things should not give either credit or blame merely to the political administration which happens to be in power in the United States, but should recognize a world-wide and irresistible force which requires that business in the future shall be conducted along different lines than business in the past. Apparently the new law is not, therefore, just a temporary thing."

That this legislation represents a predictable phase in the evolution of public attitude toward industry is obvious to every one who has considered the encouragement of uncurbed individual and corporate enterprise during the early expansion of the United States, the subsequent "trust-busting" policies of the nineties, the war-time regimentation of industry and the feverish over-production and forced selling which culminated in the crash of 1929.

Moreover, the operation of our railroads under the Interstate Commerce Commission affords an interesting precedent of long standing.

Faced with Deflation or Inflation

Just before the proposal of this legislation, we were faced with the alternatives of further deflation so drastic as to threaten the very existence of our basic institutions; or inflation with its promise of deferred wreckage. Banks, insurance companies, railway transportation, were dangerously close to collapse.

Either course might culminate in social disturbances so serious as to end the existing order and introduce unlimited misery and chaos.

Viewed in the light of these conditions, we must welcome and strive diligently to effectuate any compromise or middle course that holds even faint promise of controlling the economic machinery of the nation.

Let no one assume that the new law introduces an industrial millenium. Rather, does it represent a highly experimental device by means of which we hope to curb the on-rush of destructive economic forces.

Drastic, revolutionary, experimental as the measure is, American government and American business must cooperate strenuously and effectively toward the accomplishment of its objectives and toward the gradual elimination of those features which prove to be unworkable.

Wages for Maximum

The major purpose of the measure is to provide wages for a maximum number of people. These wages must be sufficiently large to supply the purchasing power that will keep the national industrial machine running at a load factor high enough to insure it against disintegration.

It is hoped that the spread between earnings and prices can be reduced, even though compliance with the law must of necessity increase many elements of cost. This sounds anomalous but it is not *necessarily* so.

True, increased wage rates must increase costs. Governmental administration of the law will increase the already grievous tax burden, thereby increasing costs. And probably this element of added cost will be small as compared with the increased cost of operating trade associations—paying armies of engineers, auditors, and accountants whose services must be continuously employed if the law's provisions are to be met effectively. Major executives must spend large fractions of their time in trade association work and in causing their own businesses to conform with the requirements of the law—an exceedingly serious addition to industry's cost of doing business.

The law affords union labor an opportunity without precedent for controlling working conditions in American industry. Union labor domination tends greatly to increase production costs.

A measure which has for its object the increase of buying power—reduction of the spread between wages received by labor and prices paid by labor—might be considered ineffective when compliance with its provisions clearly induces greatly increased costs.

Decrease of Unit Costs

The one means by which this apparent anomaly can be overcome is by generating a national frame of mind that will lead to buying in such volume as to decrease *unit costs* of distributing, manufacturing, administration, and selling expense.

It is conceivable that with confidence in the future fully restored, the fear of unemployment eliminated, faith in our institutions regenerated, a national buying trend may be established that will permit industry to "over-absorb" its expense burden in sufficient degree to neutralize the greatly increased elements of cost that seem to be implicit in the law.

While it is conceivable that the economic spiral, which for four years has so persistently and so viciously pursued a downward course, may thus be given an upward tendency, this outcome is by no means assured. The result depends not only upon our ability to employ our citizens and to pay a sufficient wage, but it depends no less upon innumerable other factors which will influence public sentiment.

Best Plan Proposed

We are engaged in a gamble which can only be justified by the theory that all possible alternatives hold promise of less desirable results. No one has come forward with any better suggestions or compromise between further drastic deflation and wild inflation than that which is afforded by the Industrial Recovery Act.

The administration gives organized business every opportunity of working out its salvation by mutual agreement within trade associations. It sets up conditions under which destructive minorities can be controlled by constructive majorities.

Business either must accept the challenge and prove its ability to conduct its own affairs, or look forward to complete socialization of industry, with a possible interim of unspeakable confusion and the possible development of communism.

Let us approach the appointed task with the solemn thought that we are about to discover whether the joint forces of democratic government and collective business can be so marshalled and directed as to control constructively the great economic forces which have, in some measure, been set in motion by these same agencies.

*Address to Refrigeration Distributors of Milwaukee.

REFRIGERATION INDUSTRY

Present tendencies in the refrigeration industry probably are quite obvious to you men who are on the firing line.

While household electrical refrigeration has, on the whole, fared remarkably well since 1929 as compared with kindred industries, it has, since the spring of 1932, been seriously affected by destructive tendencies induced, doubtless, by the wide-spread depression but which are, in some measure, controllable within the industry.

Future Holds Stability

If the present destructive tendencies within the industry can be corrected without delay, there is every reason to believe that the future holds stability and satisfactory profits for reasonably efficient distributors and dealers. This statement is based upon such facts as the following:

1. Contrary to the course of kindred industries, annual unit volume increased in 1930 and 1931 above the 1929 level and 1932 volume approximated that of 1929.
2. Theoretical market saturation is only 20 per cent.
3. No major device is so generally desired by the public as automatic refrigeration, a fact well demonstrated by marked increase in sales volume this year.

We may therefore approach the task imposed upon us by the Industrial Recovery Act with optimism and with a cheerful determination to make full use of its provisions to stabilize and develop an industry which holds splendid potentialities. If these possibilities are to be fully realized, each of us must pay a price, each of us must think and act in terms of the salvation of the industry—with full confidence that his own business can prosper only in the degree to which the industry as a whole is made sound, and with equal confidence that the great benefits to be derived are cheaply purchased in exchange for the price that must be paid.

TRADE ASSOCIATION

Refrigeration manufacturers are controlled by the Nema-Nira Code which was signed by President Roosevelt on Aug. 4 and which became effective Aug. 15. This is a general, basic code which is designed to govern the entire electrical manufacturing industry under the provisions of the National Industrial Act. Because of its necessarily general nature, this code cannot deal with problems of trade practice peculiar to a given industry. Provision is therefore made for supplemental codes designed to deal with such specific problems.

The Refrigeration Division of Nema, whose members were in 1932 responsible for the production and sale of 80 per cent of the electrical household refrigerators, has formulated and agreed upon a Supplemental Code which will become effective as soon as it has been approved by the Board of Governors of Nema and by the Federal administration.

Supplemental Code

This Supplemental Code deals with such matters as advertising and sales promotion, warranties and terms, and other matters of direct interest to the refrigeration industry.

It is not intended that either of these codes shall conflict with or override those codes that may be adopted by wholesale or retail merchants, when such codes have the approval of the Federal administration. We are hopeful that such wholesalers' and retailers' codes will be reasonably consistent with the provisions of the manufacturers' code.

Two such codes, now in negotiation, will be of definite interest to you. One is the code of fair competition for the electrical wholesale industry, sponsored by the National Electrical Wholesalers Association. The other is the code of fair competition for the retail trade (except food, grocery, and drug stores) now being negotiated in Washington.

We are given an opportunity to demonstrate whether we can govern ourselves in national, sectional, and local groups in such manner as to best serve the public interest. The formulation and acceptance of codes is a necessary initial step.

Must Work Together

But the mere formulation and acceptance of a code means absolutely nothing, unless we can quickly learn how to work together constructively as competitors, sufficiently submerging short-sighted, selfish interests to insure the welfare of the entire refrigeration business and the maximum benefits to the public whom we serve.

This objective cannot be accomplished by manufacturers, nor by national organizations of wholesalers or retailers unless local groups of distributors and dealers do their part.

With growing competition, reduced prices, prospects either unable or unwilling to buy, we have learned a lot of bad competitive habits. Each of us, in some degree, has become a blind Samson, bent upon bringing the structure down upon our own heads as well as those of our competitors.

If we are to support the letter, and, more particularly, the spirit of the National Recovery Act; if we are to avoid future conditions much worse than those we have experienced in the past, short-sighted and destructive competitive practices must be controlled.

Cooperation in New York

And such practices will not be controlled by the Industrial Recovery Act nor by national organizations, nor by codes, but only by effective and highly localized action on the part of distributors and dealers, by means of permanent, self-governing, cooperative organizations through which they can frequently counsel together and eliminate unsound practices.

This has been accomplished with splendid effectiveness in other communities. Refrigerator distributors in New York City have been faced with conditions as serious as any that I have ever observed. Unrestrained competition would have been ruinous to all of them. By cooperation they have avoided their most serious hazards.

What distributors and dealers have accomplished elsewhere, you can do in Milwaukee, but you can only do it by hard work, patience and persistence and a united *will* to see it through. You may depend upon the manufacturers whom I represent for any help they can lend to such a movement.

ELECTRIC REFRIGERATION NEWS
Registered U. S. Patent Office

The Newspaper of the Industry — Written to Be Read on Arrival

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EDITORIAL AIMS

To encourage the development of the art.
To promote ethical practices in the business.
To foster friendly relations throughout the industry.
To provide a clearing house for new methods and ideas.
To broadcast the technical, commercial, and personal news of the field.

VOL. 10, NO. 7, SERIAL NO. 239, OCTOBER 18, 1933

Department Stores Still an Enigma

CLEVELAND this week is playing host to merchandising managers of the nation's leading department stores. Under the auspices of the specialty appliance department of the General Electric Co., these students of mass buying instincts will get together and trade theories, practical solutions to common problems, and reactions to manufacturers' programs.

Just what conclusions may be reached by this conference cannot be predicted; but whatever develops from the discussions will be faithfully reported in ELECTRIC REFRIGERATION NEWS. Notions and opinions and methods of department store merchandisers are prime news, for this highly important outlet for electric refrigerators is still one of the industry's great enigmas.

Big Increase in 1933

How important are department stores in the refrigeration industry's sales picture? Desiring to find an answer to that query, a questionnaire was sent to department stores in Cincinnati, Cleveland, Boston, Baltimore, Philadelphia, Pittsburgh, St. Louis, Providence, New Orleans, and San Francisco. During 1932 department stores in these cities averaged $60,000 worth of electric refrigeration business each. One store reported sales amounting to $183,000.

This year these same department stores averaged 144 per cent increase in refrigeration business during the first six months as compared with the first half of 1932! One store enjoyed a 322 per cent increase, and *every department store which returned the questionnaire reported a substantial improvement over 1932 refrigeration sales.*

Unorthodox Merchandising Methods

Perhaps the chief objection, on the part of manufacturers, to department stores as electric refrigeration dealers has been their insistence on using or developing their own merchandising methods.

Not only do they refuse to have much traffic with the conventional and regulation contests, stunts, and doorbell-ringing programs devised by manufacturers, but occasionally they upset the apple cart by acclaiming almost as a body some such unorthodox selling tool as the Meter-Ice (now owned by Frigidaire) method of purchasing a refrigerator for 25 cents or even 15 cents a day.

In 1932 a Philadelphia department store sold 1,066 electric refrigerators, it is claimed, and 95 per cent of these were put out on the meter payment plan. Similar stories come in from several other important stores.

According to the questionnaire referred to above, however, not more than 10 per cent of the average department store's sales of electric refrigerators can be attributed to the coin-meter plan of payment.

This same survey reports that reverts on sales made with the aid of a coin-meter device vary from 10 to 80 per cent greater than sales made on ordinary time-payment plans.

Low Rate of Repossessions

There is nothing alarming about this statement, however, when one considers the extraordinarily low national repossession rate on electric refrigerators. C.I.T. Corp. is authority for the statement that less than 2 per cent of all electric refrigerators bought on hire-purchase plans are returned. Less than three-fourths of 1 per cent of all nationally known refrigerators purchased on time payments, according to this same important finance company, are repossessed. So even if repossessions on Meter-Ice sales were twice as great as those made otherwise, the figure would not be high.

Many of the larger manufacturers of electric refrigerators have succeeded in getting department stores to install separate departments (such as the General Electric store-within-a-store) for the sale of their products. Others sell their refrigerators under another brand name to department stores. Some distributors furnish their own trained men for floor salesmen. Smaller manufacturers sometimes depend on style or price to win sales from the line-up of competing makes on a department store floor.

Little Agreement on Methods

Price is still consistently played up in department store refrigeration advertising; and, as a corollary of this fact, it might be noted that department stores are still the principal dumping grounds for distress merchandise and out-of-date models.

No two manufacturing organizations have the same ideas concerning the best methods of conducting business relations with department stores (and incidentally it might be remarked that rarely do two persons *inside* a manufacturing organization agree on this problem). Policies on this subject have been consistently inconsistent.

It should be highly interesting, then, to discover what the department store men themselves have to say. Eyes of the industry will be focussed on Cleveland this week.

WHAT OTHERS SAY

A TIME TO DEFEND
EMPLOYER-EMPLOYE RIGHTS

BEHIND the business scenes at present is a great half-hidden turmoil of strikes and disagreements, disappointments and discord. Codes which were looked upon to do so much toward speeding industrial activity and insuring better worker-employer relations are actually leading in many instances to interrupted production and to resumption of industrial strife. So serious has the matter become that the National Electrical Manufacturers Association at its recent Cleveland meeting passed a resolution earnestly pledging allegiance to the NRA code signed in good faith, to be applied in both spirit and letter, by employer and employes alike. N.E.M.A. sees nothing less than the whole NRA program gravely imperilled by the march of events.

Reasons for the discord are not hard to find. Remedies are less evident. Idealistically working toward reduced unemployment, better working conditions, and the maintenance and even extension of the American standard of living, the administration has clothed with new powers a national, all-industry organization—the American Federation of Labor. Long all-but-dead, this body has had infused into it such vitality and authority as exceeds the ability of local divisions to apply quickly in an intelligent manner.

Industry has made great and all-but-unbelievable sacrifices to meet the president's program. It has entered upon plans to spread employment and raise wages without half a prospect of seeing where the money necessary to increase payrolls is to come from. It has shown a high order of courage. It has yielded upon many accepted basic principles of the past. To take an unfair and easy advantage of business enterprise at such a time probably is not acceptable to the great body of labor. Agitators in the field, domination by union delegates, misunderstanding of what NRA pacts really mean, are the causes of today's apparent breaches of faith. A minority is bringing discredit upon the majority.

To meet the situation industry will have to raise its head a bit further and stick out its chin and stand up defensively for its rights if disaster is to be avoided.—*Electrical World*, Oct. 7, 1933.

LETTERS

Is Your Humidifier This Good?

American Air Filter Co., Inc.
Chicago
Oct. 3, 1933.

Editor:

We have been experimenting with a great number of humidifiers because we are interested in their sale but as yet have found nothing that is ideally suited to our purposes. We know the construction and operation of most of the humidifiers on the market today.

Last year we sold a few of the portable electrical type, but the objections to them were that they are noisy and have limited capacity. We have also sold a non-electrical unit which works in conjunction with furnace heat. This unit is attractive in appearance, noiseless in operation, and ample in evaporating capacity. However, it will not work in offices nor in apartments.

Chicago is essentially a city of apartment dwellers. Most of our business is done with the Gold Coast residents and business houses in and about the Loop. There is an interest in humidifiers among people of this class, and we can capitalize on it if we can find the proper unit.

We believe that humidifier manufacturers have been going at the market backwards in that they have been driving for low price in an attempt to capture the mass market. This market does not exist at the present time, as has been amply demonstrated not only in Chicago but elsewhere. No low priced humidifier is sold in large volume at retail anywhere, so far as we know.

The mass of the people do not clearly understand humidification, but the wealthier and more intelligent people do, and this is where the real market lies, in our estimation. Incidentally, it is a market to which we have most ready access. We believe that the correct way to deal with the market for humidifiers is to sell the class market first, and this has not as yet been done.

The qualifications for an ideal humidifier which we have set up are as follows:

It should be self-supplying and also self-regulating; it should be attractive in appearance so as to harmonize with the finest home surroundings; it should be noiseless in operation and relatively economical to use; it should, of course, have adequate evaporating capacity to do the work, and this is not a matter of quarts per day but gallons per day; it should be priced somewhere around $100, preferably somewhere just under that figure.

We don't expect to get a humidifier that will fulfill all of these specifications. It is not absolutely essential that the humidifier should be self-supplying, but if it isn't it should have at least enough water storage capacity so that it doesn't have to be filled twice a day.

We are hopeful that you may know of something which will fulfill the qualifications which we have set up, and if you do hear of something, please let us know.

H. A. HUNT,
Manager.

Selling Kitchens In Texas

Electric Household Appliances, Inc.
Distributor
General Electric Kitchens
Refrigerators—Ranges—Dishwashers
—Commercial Refrigeration, Water Coolers and Air Conditioning Equipment
Interurban Bldg., Dallas, Texas
Oct. 11, 1933

Publisher:

Our letterhead may have been interesting to you, but it is more interesting, I think, to know that we are actually selling complete electric kitchens. I have been much surprised at the tremendous interest in the electric kitchen idea, particularly in this part of the country where a comfortable and efficient kitchen means so much.

Your editorial was most timely as well as a good one.

I am still hopeful that either yourself or George Taubeneck, or better still, both of you can visit this part of the country shortly. The weather is ideal, the fishing excellent and the hunting just as good, to say nothing of business.

Very truly yours,
G. C. WASSON,
President.

Vital Paper

Ferro Enamel Corp.
Cleveland
Oct. 9, 1933

Publisher:

We certainly want to congratulate you on the fine growth which ELECTRIC REFRIGERATION NEWS has had. It has become a very vital paper.

R. C. HARMON.

He Doesn't Read Walter Winchell

Electric Refrigeration News
Detroit

Post Office
St. Petersburg, Fla.

Gentlemen:

We noticed the following squib in Walter Winchell's column the other day:

". . . . in St. Petersburg, Fla., where it usually is very hot—the postoffice keeps its stamps in a refrigerator."

Can you tell us something further about this? What make of refrigerator do you use, when was it installed, and what model is it? We should also like the name of the company which made the sale, and something about the use to which the refrigerator is put.

GEORGE F. TAUBENECK,
Editor.

United States Post Office
St. Petersburg, Fla.
Oct. 9, 1933

Editor:

In your letter to us of Oct. 6, the following quotation is given which you state is from Walter Winchell's column:

". . . . in St. Petersburg, Fla., where it is usually very hot—the post office keeps its stamps in a refrigerator."

We are not familiar with Mr. Winchell's columns nor do we know from what source he received information as to the refrigeration of stamps. We do not now, nor have we ever kept stamps in a refrigerator and the temperature here compares favorably with that of any city with the exception that the summer season covers a longer period of time than the cities in the North.

R. M. HALL,
Postmaster.

Read on Arrival

Columbus, Ohio
Oct. 9, 1933

Editor:

Thank you for starting my subscription from July 26 as requested.

The NEWS is O. K.; it sure keeps us posted on latest news and I always read it first thing as soon as received, and then I'm in a position to tell the boys all about refrigerators and the N. R. A.

D. S. KIRBY.

Waits for Mail

"Your ELECTRIC REFRIGERATION NEWS is always interesting and I always await the mail carrier for it."—Xavier F. Schmidt, Bloomfield, N. J.

LONG WINS FRIGIDAIRE AIR-CONDITIONING AWARD

DAYTON—In recognition of his company for leading the entire sales organization of Frigidaire Corp. in air-conditioning sales during July and August, S. A. Long, president of the S. A. Long Electric Co., Wichita, Kan., was given an Oldsmobile sedan here Oct. 12.

Presentation was made by E. G. Biechler, president of Frigidaire; H. W. Newell, vice president in charge of sales; and J. C. Chambers, manager of the company's air-conditioning division.

PRITZLAFF SHOWS MAJESTIC RADIOS IN MILWAUKEE

MILWAUKEE—Majestic 1934 radio line was displayed by the John Pritzlaff Hardware Co., Wisconsin Majestic distributor here, at the exposition held Oct. 2 to 7 in this city under joint sponsorship of the Retail Grocers Association and the Wisconsin Radio Trades Association, according to C. W. Hamilton of the distributing organization. Total attendance at the show was 128,000.

WELLS WILL DISTRIBUTE CROSLEY LINE

PORTLAND, Ore. — Marshall Wells Co. here, with branches in Seattle and Spokane, has been appointed distributor for Crosley refrigerators and radios, according to P. W. Bialkowsky, Crosley representative in this territory.

Officers of the company are: George Young, general manager; Roy Hallabaugh, manager of the electrical merchandise department; M. R. Twiss, general sales manager; and M. C. Crosby, sales supervisor.

EDISON COMPANIES ISSUE AIR-CONDITIONING REPORT

NEW YORK CITY—Just issued to all members of the Association of Edison Illuminating Companies is a bulletin outlining and defining the various functions performed by air-conditioning equipment, and presenting the directory of air-conditioning manufacturers which appeared originally in the July 12 issue of ELECTRIC REFRIGERATION NEWS.

BLOOD SAYS MORE LEISURE WILL START BIG BUYING WAVE

DETROIT—Increased leisure among the employed is one of the greatest benefits of the NRA, and is likely to cause a great buying wave, believes Howard E. Blood, president of Norge Corp.

"Average length of the working day was 11.4 hours in 1840," he says. "As the average decreased to nine hours in 1920, consumption increased correspondingly—showing that distribution is increased not only by ability to buy but by leisure to enjoy.

"Normally, there are 48,832,589 workers in this country of whom not more than 15 per cent are now unemployed. It is estimated that the NRA has lowered the average hours of the working week by at least eight. This means that nearly 320,000,000 new leisure hours have been given to the employed."

Means More Buying

Mr. Blood cites a survey made among Milwaukee office employes recently, which revealed that with their new NRA-given leisure, 50 per cent of the women are now spending more time shopping, and 30 per cent of the men are doing more buying than they did before the recovery movement.

"Increased leisure means more desire to use things," continues Norge's president. "Held back by worries, family buying has been repressed, and many of the things now owned are ready to fall apart.

"For instance, more automobiles were junked than built last year; 8,000,000 automobiles now in use are more than seven years old. There are more than 8,000,000 obsolete radio sets, 10,000,000 outmoded kitchen ranges, 5,000,000 crippled vacuum cleaners, 4,000,000 wornout washing machines. There are 3,000,000 new homes which need to be built.

Newspaper Advertising Valuable

"There are millions of families who have repressed the desire to enjoy new home comforts which returning buying power now permits them to own," says Mr. Blood. "For example, there are 10,000,000 families waiting to enjoy their first electric refrigerator.

"Because women have always done a great deal of shopping, and because, with added leisure, more of them are doing more shopping than ever, there never was a time when newspaper advertising was so important.

"Women turn to the newspaper for their real shopping news, and department store advertising is the road map to which they refer in planning their next day's tour. So all local retailers and particularly department stores should engage in heavier use of advertising than ever before."

Electro-Kold Units Sold To 3 Apartments

SEATTLE—Three apartment houses here were recently equipped with Electro-Kold refrigeration sold by the local branch of Spokane's E. S. Matthews, Inc., Electro-Kold manufacturer.

Forty-nine of the refrigerators were purchased by the Hudson Arms apartment building management, 15 were installed in the Washington Arms apartment building, and 12 in the Van Arsdale apartments.

Other recent sales of the Seattle Electro-Kold branch include a walk-in cooler and novelty box for the Olympic pool hall at McCleary, Wash., and a four draft-arm novelty box and walk-in cooler for the rathskeller of Spokane's Dessert Hotel.

Rex Cole Insures 700 Employes

NEW YORK CITY—Rex Cole, Inc., General Electric distributor here, has adopted a double-coverage group insurance program which provides group life insurance and health and accident benefits for about 700 employes.

Individual amounts of life insurance, which vary according to the employes' grade, range from $500 to $5,000. In addition, weekly disability benefits ranging between $5 and $30 will be paid in case of sickness or injury incurred off the job.

Entire program is being underwritten by the Metropolitan Life Insurance Co. on a cooperative basis.

AIR-CONDITIONING SALES MADE IN BOSTON

BOSTON — Four sales of Westinghouse air-conditioning equipment were made here recently by Wetmore-Scott Co., Inc., Westinghouse distributor in this area. The installations were made in the president's office, Narrangansett Electric Co.; board room of the Hayden Stone Co.; executive offices, Boston Edison Co.; and offices of the R. H. White department store.

Norge Corp. Launches Winter Sales Contest

DETROIT — Starting at the very close of its September Sortie sales contest for Viking and Norsemen Club members, which ran from Sept. 1 to Oct. 15 with $12,500 for division among hign sale-makers, Norge Corp. on Oct. 16 launched a Grand Scramble contest in which members of these ace salesmen's organizations will share $17,500 in cash awards. It will close Dec. 1.

As in the Sortie, all dealers and salesmen have an equal chance to win in this contest. There are no quotas or bogeys. When all returns are in, the factory's contest managers will award each man his share, based on the relation of his sales to total sales.

WO FAT BUYS WESTINGHOUSE

HONOLULU, Hawaii—Just installed in the chop suey house of Mr. Wo Fat here is a Westinghouse refrigerator sold by the Hawaiian Electric Co.

G-E DISTRIBUTOR DIVIDES $450 AMONG SALESMEN

DALLAS, Tex.—Prizes totaling $450 have been distributed among salesmen of Electrical Household Appliances, Inc., G-E distributor here, for their accomplishments during a two-door refrigerator sales drive sponsored recently by the distributor. Winning salesmen (all of Texas) follow:

S. H. Hemphill, G. H. Flynn, Tyler; J. C. Moody, L. L. Robinson, H. C. Osborn, E. V. McNeese, L B. Gilbert, W. D. Lamar, E. B. Sanders, C. B. McNair, Al Smith, R. S. Gaston, Dallas; W. N. McDonald, Ranger; G. H. Watson, Cleburne; E. R. Williams, Decatur; H. M. Ratlor, Hillsboro.

G. C. Ramsey, Terrell; C. F. Hardy, F. F. Bennett, J. M. Boyle, K. W. Shedd, W. H. Fuller, Fort Worth; C. H. Maxwell, Wichita Falls; Frank Jones, San Agnelo; Paul Whaley, Marshall; J. C. Young, Cameron; F. F. Simpson, Nacogdoches; W. S. Moody, G. P. Fairfax, Paris; R. A. Hazelwood, W. C. Peterson, Kerrville; and Ralph Helm, Longview.

Westinghouse Salesman Lives Up to His Name

BOSTON—Leo Selya, apartment house manager for Wetmore-Scott Co., Westinghouse distributor here, lives up to his name.

His latest accomplishment was the sale of 102 BL-43 and 16 WL-30 Westinghouse refrigerators to Pelham Hall apartments here.

Another coup of Mr. Selya's was the result of his running out of gasoline one day in Brookline.

He showed the attendant pictures of the BL-55 and told the Westinghouse story. Making a return appointment for the next day in order to see the man's wife, Selya signed them up.

DISTRIBUTOR OPENS BRANCH

SEATTLE — North Coast Electric Co., Majestic distributor here, has opened a branch office at 703 Pacific Ave., Tacoma, Wash., according to officials of the company.

LONDON G-E DISTRIBUTOR WINS ESSAY COMPETITION

NEW YORK CITY—Grand prize of $40 in an International Essay Contest conducted for Monitor Top salesmen in Great Britain, France, Argentine, Brazil, and South Africa, was awarded to International Refrigerator Co., Ltd., London representative of General Electric Co.

Ideas on locating the prospect, obtaining the interview, selling the prospect, and closing the sale made up the essays.

An elimination contest preceded the main event, to determine the four best essays in each of the five countries participating. Upon receiving and judging the winning essays, International General Electric Co. here awarded the grand prize.

EATON'S INSTALLS KITCHEN

TORONTO—Eaton's department store here has just installed a G-E appliance division, feature of which is an all-electric kitchen.

European Rotary Machine Designed For Commercial Refrigeration

Sulzer Self-Contained Unit Includes Compressor, Motor, Condenser, Brine Cooler, & Brine Pump

NEW YORK CITY—Direct-connected to an electric motor so that it operates at a high speed, a new Frigorotor rotary ammonia refrigerating machine has been developed by Sulzer Bros. of Winterthur, Switzerland, and is being introduced to the American trade by David Dasso with offices here. The new machine is made in capacities from 22,000 to 102,000 B.t.u. per hour (2 to 8½ tons of refrigeration daily), and is designed for the indirect system of refrigeration—brine circulation.

Three different models of the new machine are now being manufactured by the European plant of Sulzer Bros. Types R55 and R155 mentioned in the table below constitute, as shown in Figs. 1 and 2, a compact block comprising all the elements necessary for the mechanical production of cold. Built integrally in the complete condensing unit are the brine-cooling evaporator and a pump (driven by the compressor motor) for circulating the brine to spaces requiring refrigeration.

In type R255 the compressor, motor, and condenser only are mounted on a common bedplate, while the evaporator and brine cooler with its pump are mounted separately.

In addition, type R255 is suitable for combining two units in one group with a single electric motor coupled at each side to a compressor, the whole being mounted on one common bedplate together with the condenser. Sulzer engineers expect to extend the series to include single and double blocks covering capacities from 20,000 to about 400,000 B. t. u. per block.

Dimensions of Machines

Type	Total Length mm.	Height Above Bedplate mm.	Width mm.
R-55	1690	1090	730
R-155	2270	1330	970
R-255*	1800	1365	840

*Compressor, motor, and condenser, without evaporator.

Principal parts of the new Sulzer Frigorotor are the rotary compressor, the tubular condenser, the evaporator for cooling the liquid for distributing the cold, the automatic devices, and an electric motor direct coupled to the compressor and generally also direct coupled to the cold liquid circulating pump.

New 'Frigorotor' Machine

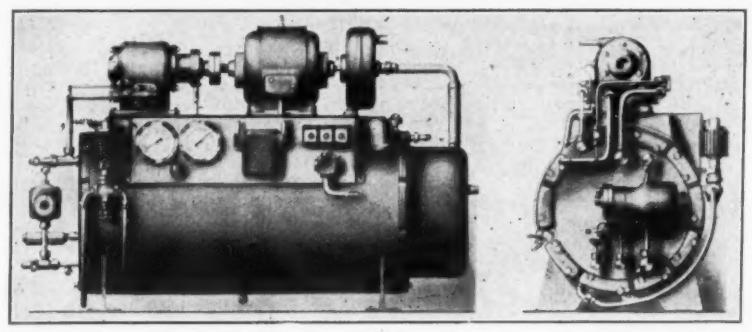


Fig. 1—New model of the Sulzer Frigorotor with a capacity of 22,000 B.t.u. per hour. The rotary compressor is at the left of the motor.

Section Showing Internal Brine Cooler

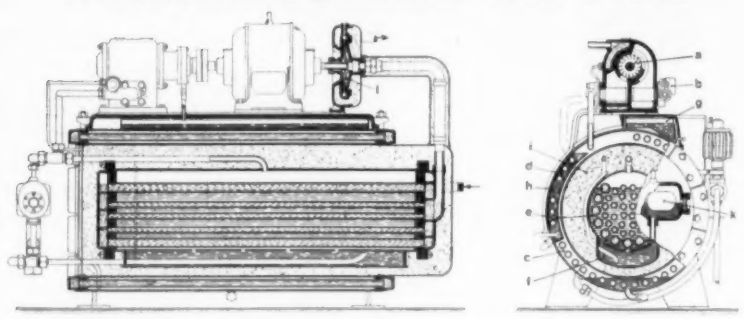


Fig. 2—Section through a 22,000-B.t.u. Sulzer machine, showing the brine cooler inside of, and insulated from, the condenser. Key to end section: a—compressor, b—ejector, c—condenser, d—oil separator, e—evaporator, f—oil tank, g—oil collector, h—oil cooler, i—insulation, k—float regulator, l—brine circulation pump.

The ammonia compressor (Figs. 3 and 4) possesses several features of interest. The shaft, of hardened and heat-treated steel, is carried in ball bearings running in an oil bath and carries a drum or rotor (See Fig. 3).

The stationary part b of the body of the compressor is not concentric with the rotor a and consequently a crescent-shaped space is formed between these two cylindrical bodies. The rotor carries grooves in which the movable blades that subdivide the space into a certain number of cells or stages of compression can slide. Centrifugal force keeps the blades constantly in contact with the inner surface of the liner of the compressor.

The cells beside the suction chamber c increase in volume in proportion to their displacement, and the ammonia gas is drawn from the chamber c through ports provided in the liner b.

As soon as a cell has attained its maximum capacity, communication with the suction chamber c is shut off, and the volume of the cell then decreases, the vapor in its being compressed to a pressure corresponding to the saturation temperature of the condenser.

The vapor then escapes through ports into the compression chamber d, from where it passes to the condenser. After having passed the discharge ports, the cells of the rotor describe the sector included between the compression chamber and the suction chamber, along which the play between rotor and liner b attains its maximum; the section which allows this play to exist is kept gas-tight by oil under pressure, cutting off all communication between the compression and suction chambers.

The coil also ensures the cells being gas-tight with respect to each other, and also the shaft with respect to the atmosphere, and provides at the same time ample lubrication for all rubbing surfaces.

The quantity of oil fulfilling these functions is many times the quantity used in reciprocating compressors. In addition, care has been had to keep the peripheral speed of the rotor at conservative values.

The liner is a special crucible cast steel. All parts of the compressor are machined with precision.

The ammonia condenser is of the tubular type, offering little resistance to the passage of the ammonia and providing regular circulation of the cooling-water. It also takes the place of the liquid separator and oil separator, besides functioning as ammonia accumulator.

Quantities of oil and ammonia in the plant are sufficient to work without replenishing for at least a year.

The water tubes are expanded in, and can be replaced in case they become attacked after a time owing to some particularly corrosive water being used.

The evaporator for cooling the brine is also of the tubular type; it has large cross-sections for the passage of the ammonia and provides sufficient circulation of the brine within the tubes.

It is fitted with a float regulator which maintains the liquid ammonia within the evaporator at a level corresponding to the maximum efficiency of the apparatus, preventing choking and thus fixing a certain temperature of superheat for the ammonia vapor drawn in.

This arrangement prevents any liquid ammonia being drawn into the compressor, and reduces the risk of frost forming on it, Sulzer engineers claim.

Cross-Section of Compressor

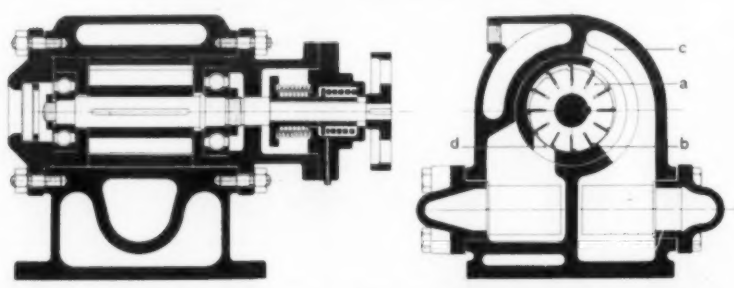


Fig. 3—Longitudinal and cross-sections through a 102,000-B.t.u. machine. Key: a—rotor, b—adjustable liner, c—suction chamber, d—compression chamber.

Rotary Compressor

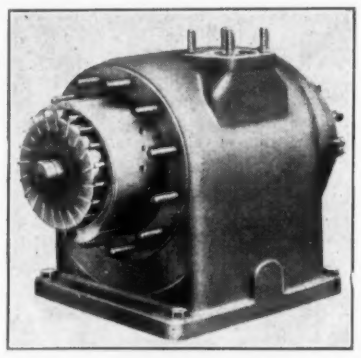


Fig. 4—End-plate removed, showing arrangement of blades in the Sulzer rotary compressor.

The evaporator and condenser are formed by two concentric cylinders, arranged in such a way that the condenser, of annular cross-section, surrounds the evaporator (Fig 2). The two are insulated from each other by a mass of cork, which is sterilized and sealed against moisture.

Covers at the ends of the cylinders are removable, thus allowing making the tubes easy of access for inspection, cleaning and replacement when necessary.

In type R55 the centrifugal pump for circulating the cold liquid is direct coupled to one end of the shaft of the electric motor that drives the compressor; in type R155 the pump is driven by a separate motor which is however mounted at the end of the evaporator and coaxial with it. The body of the pump is insulated so that it does not become covered with frost.

The pump for circulating the cold in type R255 is mounted separately and has its own electric motor.

Automatic Devices

The automatic devices include on the one hand the apparatus necessary for automatically starting or stopping the compressor and the pump according to the quantity of cold required in the insulation, and on the other hand the safety apparatus, which come into operation should the supply of water fail or the electric current be unexpectedly interrupted. There are also the usual fuses, etc., for protecting the electric motor.

The compressor and pump are generally started and stopped under the control of a thermostat which is influenced by the temperature of the locality to be cooled, or in other cases by the temperature of the brine itself.

The supply of cooling-water to the condenser is controlled by an electromagnetic valve which closes automatically whenever the compressor is stopped, and opens again when it is started.

The automatic safety apparatus included in the same electric circuit comprise two safety pressure gauges with rocking mercury tubes which break the circuit, one of them when the pressure exceeds the permissible maximum, and the other when it falls below the minimum.

The pressure may rise too high in consequence of lack of water, and it may fall too low if the brine circulating pump stops or if a thermostat does not work properly.

The electric motor is protected either by automatic thermal cut-outs, or by a thermal switch box, which in this case serves at the same time as principal cut-out.

The non-freezable liquid used for distributing the cold is cooled during its passage through the evaporator and is forwarded by the pump through pipes to the different places where cold is required, after which it returns to the evaporator.

This process lends itself very easily to the installation of a cold accumulator which, when put into use to cope with a momentary extra demand for cold, allows the compressor to be chosen with a normal refrigerating capacity.

If electric energy is supplied on a differential rate, such an accumulator can be charged by running the compressor at full capacity during the hours when the current is cheapest, this store of cold being then drawn on at times when the charge for electricity is high.

According to the capacity required for the cold accumulator, the latter is placed within or without the localities served by it. If placed inside it may be advantageously designed as a tubed tank, 2 to 5 m. long and 200-300 mm. in diameter, fixed to the ceiling or walls (Fig. 6).

If the capacity of an accumulator of this type is not sufficient, it will be necessary to arrange an accumulator outside the localities to be cooled (Fig. 7), and generally designed of such a size to suit the fluctuations occurring in the demand for cold in the course of a day.

Cases in which this latter method is generally used, are dairies where the milk on arrival must be cooled rapidly in the evening and in the morning, or chemical industries where the heat of reaction of certain operations that have to be carried out at a low temperature requires the absorption at definite intervals of a quantity of cold in excess of the normal refrigerating capacity of the compressor.

The cold accumulator also plays an important part in the handling of unfermented grape juice or cider, where the cooling of the liquid itself only lasts for a few hours, during which time a much greater quantity of cold is required than for maintaining the liquid later at a definite temperature in the storage vaults.

When the cold is transmitted indirectly by brine, the evaporating temperature required for the ammonia is generally slightly lower than that required with direct evaporation; but in the Sulzer system this inconvenience hardly comes into consideration at all, Sulzer engineers declare because there is only a very small difference in temprature between the ammonia and the non-freezable liquid in the evaporator.

In certain cases where one part of the installation (such as freezing rooms at –5° C.) is submitted to a temperature considerably lower than the rest of the installation (rooms at +2 or +4° C.), it will be found advantageous to use for the low temperature part a special circuit with direct evaporation of ammonia, branched off from the principal circuit and connected to the evaporator brine cooler, which then forms a liquid separator for this secondary circuit (see Fig. 8).

This method enables a low temperature to be obtained at a certain spot without having to lower the temperature of evaporation for the whole installation. The ammonia evaporator may be fitted with an electromagnetic stop valve, controlled by a thermostat, which stops the injection of ammonia

(*Concluded on Page 9, Column 1*)

Refrigeration Cycle

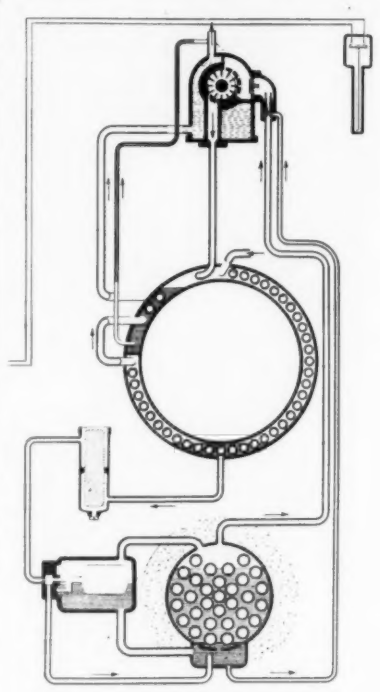


Fig. 5—Diagram of the ammonia circuit, showing circulation of brine and cooling water in a 22,000-B.t.u. Frigorotor.

Application of Cold Accumulators

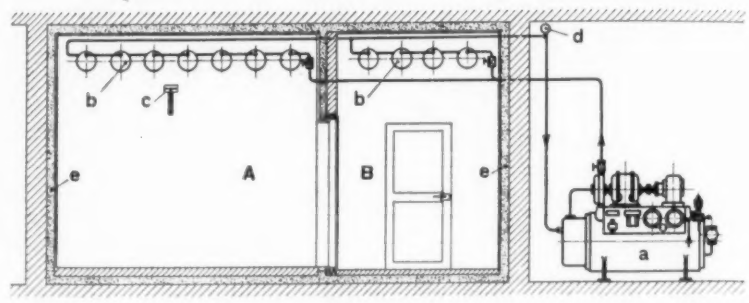


Fig. 6—Cold accumulators installed inside a cold room. Key: A—cold room, B—anteroom, a—refrigerating machine, b—cold accumulators, c—thermostat, d—expansion tube, e—insulation.

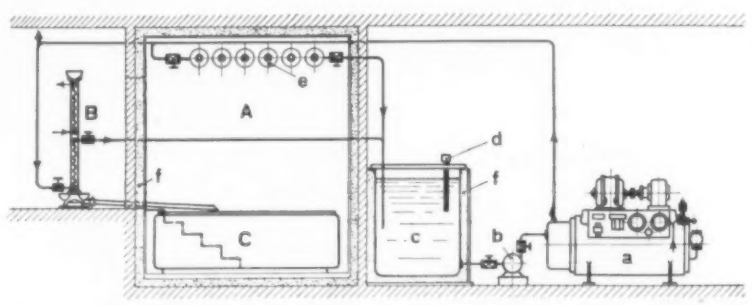


Fig. 7—Cold accumulators outside the cold room. A—cold room, B—milk cooler, C—milk tank, a—refrigerating machine, b—brine pump, c—cold accumulator, d—thermostat, e—cooling unit, f—insulation.

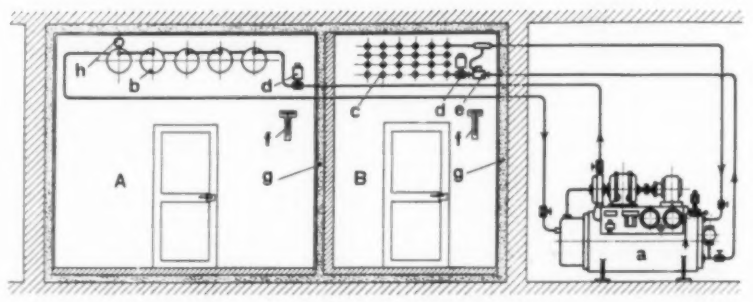


Fig. 8—Rooms with different types of refrigeration. A—room cooled to 35 to 39° F. by brine circulation, B—room cooled to 14 to 23° F. by direct expansion. a—refrigerating machine, b—cold accumulators, c—direct expansion evaporators, d—electro-magnetic stop valve, e—regurator, f—thermostats, g—insulation, h—expansion tube.

ENGINEERING

EUROPEANS DEVELOP COMMERCIAL UNITS

(Concluded from Page 8, Column 5)

whenever the prescribed temperature has been reached.

In this way it is also possible to regulate the injection of ammonia as a function of the temperature or of the pressure of the gas when it leaves the evaporator, or it may be regulated in accordance with the level of the liquid ammonia in the evaporator. The regulator is controlled by a diaphragm in the first case and by a float in the second.

The cooling units installed in the localities to be cooled, may vary according to the conditions of temperature at which the rooms have to be kept. They may be of finned tubes for temperatures above zero, of smooth tubes in localities to be kept below zero, or they may be of the accumulator tube type of large volume as described above when it is found desirable to accumulate the cold within the room itself.

All these tubes are grouped together in cooling systems or batteries placed either on the ceiling or against the walls of the rooms where cooling has to be effected by simple radiation. When it is important that the air in the room should be particularly dry, the air may be kept in motion by a fan.

Regulating the distribution of refrigeration (quantity of brine to be kept in circulation for each particular spot where refrigeration is required) is effected by means of valves which may be adjusted by hand or by electromagnetic means, controlled by a low-tension electric circuit or under the control of thermostats placed in the locality to be cooled.

In order to preserve the freshness of certain perishable food-stuffs, it is not only necessary to keep it at a certain temperature and in air of a certain degree of humidity; it is also necessary to renew the air continually by introducing a certain quantity of fresh air from outside.

For this purpose, in localities cooled by radiation, it is necessary to install a special fan to direct this fresh air into the refrigerating tubes before it is mixed with the air in the room. This precooling of the air prevents condensation of moisture on the stored goods.

In localities cooled by an air cooler worked by a fan, it is possible to provide a simple set of valves with approximate connections in order to obtain the same result. The vitiated air is expelled to atmosphere in consequence of the slight overpressure caused within the room by the fan. The quantity of fresh air introduced is regulated by means of a valve at the suction side of the fan.

Unloader Designed For Ammonia Machine

MINNEAPOLIS—New instantaneous unloader for small synchronous-motor-driven compressors is being introduced by the Electric Machinery Mfg. Co. here. When used with an automatic motor control, this unloader eliminates necessity for manual by-passing when the motor is started, says the manufacturer.

With this unloader, automatic start-stop operation of the compressor can be secured, proper temperatures being maintained by brine thermostats, suction pressure controls, etc., company engineers explain. The unloader also keeps a compressor running through momentary voltage dips.

The device is an automatic pressure-differential-operated by-pass valve connected between the suction and discharge on the compressor. The valve is operated by ammonia gas pressure differential, and is controlled by the frequency responsive relay on the synchronous motor starting panel.

When the motor is started, the pilot valve is energized and a small amount of high pressure ammonia gas is relieved from the unloader to actuate it. This gas is returned to the low pressure side of the system.

4 KELVINATOR-TEMPRITES COOL PHILADELPHIA BEER

PHILADELPHIA—Kelvinator-Temprite beer cooling equipment has been installed in four prominent food serving establishments in Philadelphia and vicinity.

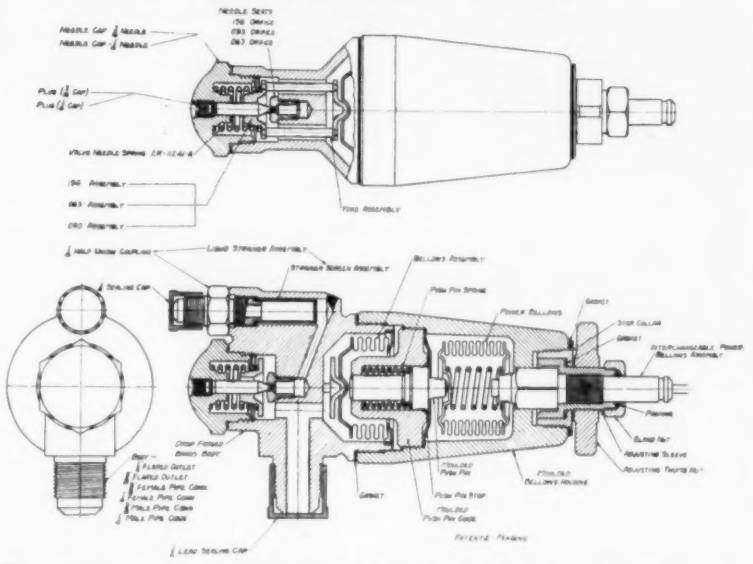
Installed in the Venice Grill, an old established sea food cafe, are three 30B2 Temprite coolers and one 40B2 cooler, serving eight beer spigots and two water spigots. Two Kelvinator forced convection cooling units refrigerate the keg storage, and a 2-hp. Kelvinator condensing unit handles the refrigeration load.

The installation at "Patrick O'Connors," an old landmark among food and drink establishments, consists of two Temprite 40B2 and two Temprite 30B2 coolers, serving eight beer draft arms and two water spigots; a forced convection unit in the beer storage cooler, and a 1½-hp. condensing unit.

Thirsty members of the Westmoreland Republican Association can find relief at their headquarters, where a 40B3 Temprite cooler operating from a ¾-hp. compressor has been installed.

The "Sunken Gardens," an excusive rendezvous at Wyncote, Pa., has been equipped with a 40B3 Temprite cooler and a Kelvinator condensing unit.

New Fedders Valve



New thermostatic expansion valve of Fedders Mfg. Co. The valve has a power element which can be removed "on the job."

HOYT EXPLAINS DESIGN OF REFRIGERATED TRUCKS

(Concluded from Page 1, Column 3)

generally lined with plywood, ⅜-in. three-ply being most commonly used. Most bodies are covered with metal outside, and on well constructed bodies, the metal is backed by plywood which assists the strength of the body and adds some insulating value.

To reflect heat, the exterior should be finished in white, or aluminum paint, Mr. Hoyt advised, then added as a general comment on the first part of his talk that "weight is an even greater stumbling block than price, because price is only a temporary pain, while the pain of weight is permanent."

Methods of refrigeration were next considered by Mr. Hoyt. There are several different methods in use, each having its own development. Oldest is salt and ice, probably the best known on account of its age. Here, the low cost of the ice is the dominant factor, he said.

"Next refrigerant is dry ice," he continued. "In contrast to water ice, price in this case is the thing which holds dry ice back. Its price is about three times as great as water ice, but to counteract this is the fact that the weight required is only one-fifth to one-sixth that of water ice. Another advantage is the absence of corrosion when using dry ice.

Mechanically Refrigerated Trucks

"Third method is the use of a mechanical refrigerating machine which has several different applications. The most common is a direct expansion coil with a condensing unit driven either by a gasoline engine or power take-off.

"Some new systems use a brine pad, a eutectic brine which freezes and melts, making possible use of latent heat of freezing and giving a considerable holdover. Frequently, such units are motor-driven and are operated only at night by being plugged into an a.c. circuit. During the day the brine pad carries the load."

Mr. Hoyt next described a system using a combination of dry ice and methyl chloride. The methyl chloride evaporates in a chilling coil and condenses in a second coil surrounding the dry ice which is contained in an insulated compartment, he explained.

The flow of the methyl is controlled by a throttle valve to regulate temperature. This system should be particularly advantageous in high temperature installations where perishables are carried, he believes.

"Experiments are also being conducted with the use of a volatile fuel which first passes through a coil where it expands, later passing through the motor as a fuel. Many problems have presented themselves which must be solved before the system can be successful," said the speaker.

"Truck owners are slowly coming to consider truck refrigeration on the basis of yearly cost instead of initial investment, which, of course, is the sensible way of approaching the problem.

"As an example of the economies of dry-ice construction, Drayer-Hanson built about five years ago, a body holding 400 gal. of ice cream and mounted on a 2½-ton truck. This body was refrigerated with salt and ice and required 400 lbs. of ice at a time.

"During the last year they have built several bodies holding 450 gal. of ice cream, mounted on 1½-ton trucks and requiring only 40 lbs. of dry ice. This body mounted on a lighter truck, created a total saving of $1,600 on the equipment."

In Mr. Hoyt's opinion, the greatest disadvantage of solid CO_2 is the lack of temperature control. Partial temperature control can be obtained by keeping the ice under a slight pressure, by using the correct amount, and by wrapping it sufficiently.

Thermostatic Valve Is Designed by Fedders

(Concluded from Page 1, Column 4)

can be made to obtain a superheat range of 45° F., according to Mr. Keefe.

Power element housing, push-pin, and guide are made of moulded compounds of low thermal conductivity to insulate the power element from the low temperature of the valve. Valve body is a drop forging, and the valve needle is of stainless steel topped with Stellite. The needle seat is made of stainless steel slightly softer than the needle so that pressure at the point of contact is taken up by the seat, Mr. Keefe states.

ALLEN-BRADLEY DEVELOPS NEW STARTING SWITCH

MILWAUKEE—New solenoid-operated across-the-line starting switch is being introduced by the Allen-Bradley Co. here.

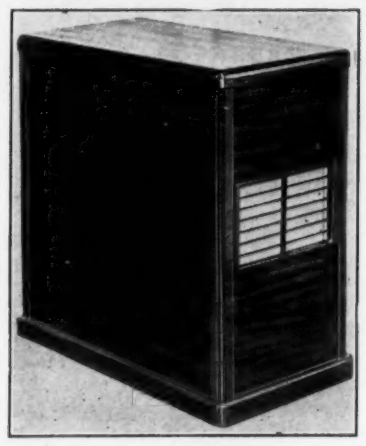
The switch is rated at 5 hp., 220 volts; 7½ hp., 440-550 volts for polyphase motors, and up to 1½ hp., 110 volts; and 3 hp. 220 volts for single phase self-starting motors.

It is being made in three types. First has start and stop push buttons, second has no push buttons and is for thermostat or remote pilot control, and the third is a two-way hand-automatic switch for tryout control installations, according to Allen-Bradley engineers.

Feature of the new mechanism is its small cabinet dimensions, obtained by reduction in size of the switching mechanism. Double-break silver alloy contacts are used, and a new arc hood suppresses the arc to such an extent that locked rotor currents of motors several times the rating of the switch can be broken without flash-over or distress, the manufacturer claims.

Two Allen-Bradley Resisto-Therm relays with interchangeable thermal elements provide overload protection.

Air Washer



New cabinet-type humidifier and air washer of Campbell Metal Window Corp.

CAMPBELL METAL WINDOW BUILDS AIR HUMIDIFIER

(*Concluded from Page 1, Column 5*)

ficials declare, to do a profitable year-'round business because they can supply needs of a prospect who wants equipment for air-conditioning functions at a certain time of year, and has neither the funds nor the desire for a unit doing a complete air-conditioning job.

The company manufactures equipment for complete air conditioning, and this is merchandised by dealers along with equipment for a limited number of functions.

LAURIE HEADS DuCOMB CO. REFRIGERATION DEPT.

DETROIT—M. J. Laurie, formerly connected with General Electric Co. and Westinghouse Electric & Mfg. Co., has been appointed head of the refrigeration department of W. C. DuComb Co., Inc., agent for Fedders Mfg. Co., Penn Electric Switch Co., L. H. Gilmer Co., and Imperial Brass Co.

KASON INTRODUCES DOUBLE LATCH STRIKE

BROOKLYN—For use on two-door refrigerator cabinets, a new double latch strike is being introduced by the Kason Hardware Corp. here. The "Twin Keeper" is available for the manufacturer's K-40A and K-20 locks, and has two separate strikes and two micrometer adjustment screws.

Advertising Expenditures of Industry in National Magazines Over 5-Year Period (1928-32)

GENERAL ELECTRIC

General Electric Co. (Refrigeration only)	1928 $789,567	1929 $931,145	1930 *$981,099	1931 *$950,610	1932 $478,856	Total $4,131,277
Saturday Eve. Post	220,000	208,500	235,000	385,500	218,150	1,267,150
Ladies' Home Journal	125,000	112,500	100,000	87,500	50,000	475,000
Good Housekeeping	52,780	89,490	90,670	64,400	55,200	352,540
Woman's Home Comp.	78,390	96,270	78,840	98,760	.....	325,260
Collier's	18,500	45,000	59,775	73,000	33,000	229,275
Cosmopolitan	44,610	45,000	57,500	51,750	27,200	226,060
American Magazine	60,000	54,000	68,000	.....	18,000	200,000
Better Hms. & Gardens	.....	38,535	55,180	34,200	17,100	145,015
McCall's	.....	.....	64,200	78,400	.....	142,600
Pictorial Review	38,250	80,500	23,000	.....	.....	141,750
Literary Digest	32,400	40,000	69,000	.....	.....	141,400
National Geographic	24,650	25,730	26,785	21,600	.....	93,765
Liberty	37,500	25,000	.....	.....	30,000	92,500
House & Garden	5,087	17,240	.....	22,200	13,015	57,542
New Yorker	.....	8,400	13,189	21,300	.....	42,889
Time	.....	6,600	19,350	9,450	5,951	41,351
House Beautiful	3,600	10,200	15,200	.....	.....	29,000
Vogue	5,087	17,460	.....	.....	.....	22,547
Vanity Fair	3,213	10,270	.....	.....	.....	13,933
World's Work	7,756	.....	.....	.....	.....	7,756
Atlantic Monthly	6,893	.....	.....	.....	.....	6,893
Golden Book	6,893	.....	.....	.....	.....	6,893
Review of Reviews	6,893	.....	.....	.....	.....	6,893
Harper's Bazaar	6,549	.....	.....	.....	.....	6,549
American Home	.....	.....	.....	.....	6,460	6,460
Scribner's	5,516	.....	.....	.....	.....	5,516
Country Gentleman	.....	.....	5,410	.....	.....	5,410
Fortune	.....	.....	.....	.....	4,780	4,780
Nation's Business	.....	.....	.....	2,550	.....	2,550

FRIGIDAIRE

Frigidaire Corp. (Total refrigeration)	1928 $784,566	1929 *$992,319	1930 *$619,881	1931 *$761,135	1932 $488,050	Total $3,645,951
Saturday Eve. Post	218,000	277,000	134,000	184,500	176,900	990,400
Ladies' Home Journal	125,000	150,000	87,500	100,000	73,500	536,000
Woman's Home Com.	104,560	131,040	78,760	96,000	70,000	480,360
Collier's	63,000	102,000	92,000	114,400	73,850	445,250
Good Housekeeping	75,650	99,955	80,840	73,600	61,800	391,845
Cosmopolitan	30,000	46,200	38,400	47,400	....	152,000
American Magazine	24,000	55,000	44,000	25,500	....	148,500
Better Homes & Gardens	....	19,035	22,751	41,400	29,200	112,386
Literary Digest	60,000	29,700	....	....	....	89,700
National Geographic	24,769	28,320	....	....	....	53,089
House Beautiful	2,000	11,500	7,600	9,025	....	30,125
House & Garden	2,693	16,849	10,400	....	....	29,942
New Yorker	....	6,750	7,830	13,780	850	29,210
Pictorial Review	17,000	....	....	10,500	....	27,500
Liberty	25,500	....	....	....	....	25,500
Time	....	6,200	8,400	10,010	....	24,610
Nation's Business	....	....	7,400	9,600	1,300	18,300
American Home	....	....	....	14,220	....	14,200
McCall's	....	....	....	11,200	....	11,200
Vogue	2,693	4,995	....	....	....	7,688
Harper's Bazaar	2,910	4,710	....	....	....	7,620
Vanity Fair	1,701	3,065	....	....	....	4,766
World's Work	3,447	....	....	....	....	3,447
Atlantic Monthly	3,064	....	....	....	....	3,064
Reviews of Reviews	3,064	....	....	....	....	3,064
Golden Book	3,063	....	....	....	....	3,063
Scribner's	2,452	....	....	....	....	2,452
Business Week	....	....	....	....	650	650

KELVINATOR

Kelvinator Corp. (Total refrigeration)	1928 $ 89,520	1929 *$181,161	1930 $237,609	1931 *$302,900	1932 $248,200	Total $1,059,390
Saturday Eve. Post	64,000	84,500	142,000	154,000	118,500	563,400
Good Housekeeping	25,520	29,365	38,100	36,800	46,000	175,785
Ladies' Home Journal	.....	9,500	9,500	75,000	.....	94,000
Collier's	.....	9,000	.....	32,000	40,000	81,000
McCall's	.....	.....	.....	.....	43,300	43,300
Better Hm. & Gardens	.....	9,495	18,454	.....	.....	27,949
National Geographic	.....	12,865	10,655	.....	.....	23,520
American Magazine	.....	13,600	.....	.....	.....	13,600
House & Garden	.....	5,226	4,200	.....	.....	9,426
Woman's Home Comp.	.....	.....	8,800	.....	.....	8,800
New Yorker	.....	3,110	3,900	.....	.....	7,010
House Beautiful	.....	4,500	2,000	.....	.....	6,500
Nation's Business	.....	.....	.....	5,100	.....	5,100

WESTINGHOUSE

Westinghouse Electric & Mfg. Co. (Westinghouse electric refrigeration)	1928 $	1929 $	1930 $	1931 $322,900	1932 $308,575	Total $ 631,475
Saturday Eve. Post	.....	.....	.....	210,000	102,600	312,600
Ladies' Home Journal	.....	.....	.....	58,000	42,900	100,900
Collier's	.....	.....	.....	25,000	18,750	43,750
Good Housekeeping	.....	.....	.....	13,200	26,400	39,600
Woman's Home Comp.	.....	.....	.....	.....	30,000	30,000
Cosmopolitan	.....	.....	.....	11,000	15,300	26,300
Literary Digest	.....	.....	.....	.....	19,025	19,025
McCall's	.....	.....	.....	.....	17,800	17,800
American Magazine	.....	.....	.....	.....	16,200	16,200
Better Hms. & Gardens	.....	.....	.....	.....	16,000	16,000
New Yorker	.....	.....	.....	4,500	3,600	8,100
Nation's Business	.....	.....	.....	1,200	.....	1,200

*Includes water cooler advertising expenditures.

ELECTRIC REFRIGERATION BUREAU

Electric Refrigeration Bureau (Sponsored by the Edison Electric Institute)	1928 $	1929 $	1930 $	1931 $179,700	1932 $141,521	Total $321,221
Saturday Evening Post	....	....	....	124,500	77,350	201,850
Good Housekeeping	....	....	....	55,200	27,600	82,800
McCall's	....	....	....	....	32,100	32,100
Time	....	....	....	....	4,471	4,471

LEONARD

Leonard Refrigerator Co. (Total refrigeration)	1928 $ 60,600	1929 $ 83,050	1930 $ 50,265	1931 $ 76,556	1932 $ 46,000	Total $ 316,471
Saturday Eve. Post	.....	21,500	21,000	47,000	46,000	135,500
Ladies' Home Journal	22,000	14,250	.....	14,250	.....	50,500
American Magazine	18,400	13,600	8,500	.....	.....	40,500
Good Housekeeping	20,200	.....	.....	11,250	.....	31,450
McCall's	.....	12,300	8,800	1,100	.....	22,200
Pictorial Review	.....	12,750	.....	.....	.....	12,750
Woman's Home Comp.	.....	8,650	.....	.....	.....	8,650
Better Hm. & Gardens	.....	.....	4,790	.....	.....	4,790
True Story	.....	.....	4,225	.....	.....	4,225
Household Magazine	.....	.....	2,950	798	.....	3,748
Country Gentleman	.....	.....	.....	625	.....	625
Country Home	.....	.....	.....	588	.....	588
Successful Farming	.....	.....	.....	504	.....	504
Farmer's Wife	.....	.....	.....	441	.....	441

NORGE

Norge Corp. (Total refrigeration)	1928 $	1929 $	1930 $	1931 $125,450	1932 $143,200	Total $ 268,650
Saturday Eve. Post	.....	.....	.....	94,500	76,500	171,000
Good Housekeeping	.....	.....	.....	22,400	46,200	68,600
Better Hms. & Gardens	.....	.....	.....	8,550	20,500	29,050

COPELAND

Copeland Products, Inc. (Total refrigeration)	1928 $65,843	1929 $32,000	1930 $51,000	1931 $32,000	1932 $48,274	Total $229,117
Saturday Evening Post	32,000	32,000	51,000	32,000	16,000	163,000
Good Housekeeping	8,850	....	....	....	9,593	18,443
Delineator	1,350	....	....	....	12,600	13,950
Collier's	7,500	....	....	....	5,500	13,000
Cosmopolitan	5,800	....	....	....	....	5,800
Liberty	3,064	....	....	....	....	3,064
Literary Digest	2,700	....	....	....	....	2,700
National Geographic	2,475	....	....	....	....	2,475
Harper's Bazaar	188	....	....	....	2,175	2,363
New Yorker	....	....	....	....	1,700	1,700
Time	....	....	....	....	706	706
Modern Priscilla	625	....	....	....	....	625
House & Garden	312	....	....	....	....	312
World's Work	219	....	....	....	....	219
Atlantic Monthly	200	....	....	....	....	200
Golden Book	200	....	....	....	....	200
Review of Reviews	200	....	....	....	....	200
Scribner's	160	....	....	....	....	160

	1928	1929	1930	1931	1932	Total

SERVEL

Servel, Inc (Servel Hermetic electric refrigeration)	1928 $ 67,400	1929 $	1930 $ 23,000	1931 $ 80,500	1932 $ 54,400	Total $ 225,300
Saturday Eve. Post	42,000	.....	23,000	80,500	32,000	177,500
Good Housekeeping	25,400	.....	.....	.....	22,400	47,800

GIBSON

Gibson Refrigerator Co. (Total refrigeration)	1928 $ 42,772	1929 $30,053	1930	1931	1932 $ 25,400	Total $ 98,225
McCall's	7,600	4,100	.....	.....	25,400	37,100
Good Housekeeping	11,275	14,235	.....	.....	.....	25,510
Ladies' Home Journal	14,250	9,500	.....	.....	.....	23,750
Liberty	4,126	.....	.....	.....	.....	4,126
House & Garden	1,871	1,318	.....	.....	.....	3,189
Modern Priscilla	2,450	.....	.....	.....	.....	2,450
House Beautiful	1,200	900	.....	.....	.....	2,100

GRIGSBY-GRUNOW

Grigsby-Grunow Co. (Majestic Electric Refrigeration)	1928 $	1929 $	1930 $ 55,200	1931 $ 32,050	1932 $ 56,000	Total $ 143,250
Saturday Eve. Post	.....	.....	.....	24,000	56,000	80,000
Good Housekeeping	.....	.....	55,200	.....	.....	55,200
Collier's	.....	.....	.....	5,500	.....	5,500
New Yorker	.....	.....	.....	2,550	.....	2,550

CROSLEY

Crosley Radio Corp. (Refrigeration only)	1928 $ 2,700	1929 $37,239	1930 $12,173	1931	1932 $15,874	Total $ 67,986
Country Gentleman	....	10,125	1,633	....	403	12,161
Successful Farming	2,700	6,072	1,260	....	....	10,032
Saturday Evening Post	....	....	....	....	8,638	8,638
Household Magazine	....	7,270	1,071	....	....	8,341
Country Home	....	3,272	1,260	....	....	4,532
Woman's World	....	4,400	....	....	....	4,400
Capper's Farmer	....	3,000	1,050	....	....	4,050
Farmer's Wife	....	3,100	441	....	....	3,541
Popular Mechanics	....	....	3,023	....	230	3,253
Farm Journal	....	....	1,260	....	....	1,260
People's Popular Monthly	....	....	1,175	....	....	1,175
Liberty	....	....	....	....	894	894
Literary Digest	....	....	....	....	784	784
Ladies' Home Journal	....	....	....	....	756	756
Time	....	....	....	....	705	705
Collier's	....	....	....	....	686	686
National Geographic	....	....	....	....	650	650
American Magazine	....	....	....	....	616	616
Woman's Home Companion	....	....	....	....	378	378
McCall's	....	....	....	....	311	311
True Story	....	....	....	....	308	308
Pictorial Review	....	....	....	....	280	280
New Yorker	....	....	....	....	235	235

TRUPAR

Trupar Mfg. Co. (Mayflower electric refrigeration)	1928 $	1929 $	1930 $	1931 $ 21,705	1932 $ 39,250	Total $ 60,955
Saturday Eve. Post	.....	.....	.....	16,000	28,000	44,000
Good Housekeeping	.....	.....	.....	.....	11,250	11,250
Better Hms. & Gardens	.....	.....	.....	4,275	.....	4,275
Time	.....	.....	.....	1,430	.....	1,430

QUESTIONS

Solid CO_2 Refrigerators

No. 1395 (Washington, D. C.)—"If available, I would appreciate receiving a list of firms manufacturing dry ice refrigerator boxes for domestic and commercial use."

Answer—We have record of only one household refrigerator being built to utilize solid CO_2. This is the "Carba" refrigerator made by Fleetwood Sales, Inc., 4519 Walnut St., Philadelphia, Pa.

Manufacturers of ice cream cabinets for this refrigerant are more numerous. The list follows:

Anheuser Busch, Inc., St. Louis, Mo.
Alex Christie Co.
1516 Thirteenth Ave., Seattle, Wash.
Cope Co., 27 Ball St., Irvington, N. J.
Consolidated Equipment Corp.
Greenville, Mich.
Facto Auto Body Co.
12910 Taft Ave., Cleveland, Ohio.
Fitzgibbon & Crisp, Inc., Trenton, N. J.
Foremost Refrigeration, Inc.
Foot of 20th St., Brooklyn, N. Y.
John J. Grothe Corp.
21st St. & Godfrey Ave., Philadelphia, Pa.
Robbins & Burke, Inc.
20 Green St., Cambridge, Mass.
Henry Schultz, Inc.
1949 41st St., Long Island City, N. Y.
A. E. Warwick Co.
14 Franklin St., Stoneham, Mass.

There has also been considerable activity in the manufacture of refrigerated motor trucks using solid CO_2. For a complete list of companies building such equipment see page 5 of the August issue of REFRIGERATED FOOD NEWS.

Compressor Seals

No. 1396 (Dealer, California)—"We would like the names of companies manufacturing sylphon seals for the various refrigerators."

Answer—Manufacturers of compressor seals are:

Bridgeport Brass Co.
778 E. Main St., Bridgeport, Conn.
Clifford Mfg. Co.
564 E. First St., Boston, Mass.
Mueller Brass Co.
1925 Lapeer Ave., Port Huron, Mich.
Rotary Seal Co.
809 W. Madison St., Chicago, Ill.

Stock Liquidations

No. 1397—"Can you furnish the names of the electric refrigerator companies that have gone out of business and are liquidating their stock?"

Icy-Ball Refrigerator

No. 1398 (Dealer, New Jersey)—"Kindly advise where we can obtain information on the Icy-Ball refrigerator."

Answer—Crosley Radio Corp., Arlington St., Cincinnati, Ohio.

Service Men's Code

No. 1399—"Can you furnish us with anything pertaining to the NRA code on refrigeration service and installation men?"

Answer—We know of no code with specific provision for refrigeration service and installation men being submitted to NRA officials.

Altitudes of Cities

No. 1400—"We are desirous of purchasing a guide map, catalog, or data giving a complete altitude record of all cities and towns in the United States."

Answer—Consult government records in the public library.

PATENTS

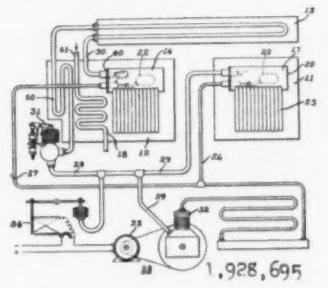
ISSUED OCT. 3, 1933

1,928,639. METHOD OF MAKING HEAT EXCHANGERS. Alfred J. Berg, Portsmouth, N. H. Application Nov. 14, 1929. Serial No. 407,087. 9 Claims. (Cl. 29—157.3.) (Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757.)

1. The method of permanently attaching a metal ribbon to a metal tube which includes the following substantially simultaneously executed steps or progressively rolling metal of the tube inwardly in a definite path to form on said tube an external groove and a coincident internal rib while the bore of said tube is unsupported in said path; progressively coiling about the tube and pressing into said groove a portion of the metal ribbon which is to form the fin; progressively compressing metal of the tube adjacent the groove into gripping engagement with the metal ribbon to firmly secure the ribbon in place; and progressively supporting the tube adjacent said path against lateral deflection by, and substantially at the place where, the stresses occasioned by said steps are applied to the tube.

1,928,695. REFRIGERATING APPARATUS. Jesse G. King, Dayton, Ohio, assignor to Frigidaire Corp., Dayton, Ohio, a Corporation of Delaware. Application Aug. 31, 1928, Serial No. 303,263. Renewed Oct. 21, 1932. 8 Claims. (Cl. 62—115.)

1. A soda fountain comprising in combination an ice cream storage compartment, a water cooling compartment, a syrup compartment, an evaporator for cooling each of said compartments, the syrup compartment evaporator and water compartment evaporator being connected in series, a condensing element for supplying liquid refrigerant to the ice cream compartment evaporator and water compartment evaporator, and conduits for returning the evaporated refrigerant from the ice cream compartment evaporator and from the syrup compartment evaporator, the conduit from the syrup compartment evaporator passing through the water cooling compartment.



1,928,755. REFRIGERATING MACHINE. Bicknell Hall, Gloucester, Mass., assignor to Frosted Foods Co., Inc., Dover, Del., a Corporation of Delaware. Application Aug. 18, 1930. Serial No. 476,061. 23 Claims. (Cl. 62—114.)

23. A refrigerating machine having heat-conductive walls forming an elongated rectangular passage adapted to receive at one end an unfrozen material in bulk, partitions movable in spaced relation through said passage for feeding the material therethrough and dividing it into defined blocks, and means for refrigerating the blocks thus formed during their transit of the passage, the side walls of the passage being parallel throughout the refrigerating path.

1,929,074. ICE CREAM STORAGE CABINET. Percy Ray Main, Haverhill, Mass. Application March 14, 1932. Serial No. 598,676. 3 Claims. (Cl. 62—95.)

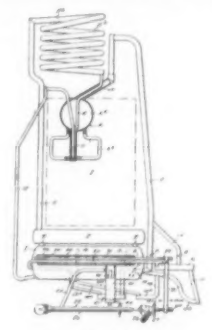
1. A refrigerating cabinet comprising an outer casing having a top opening, a storage chamber within said casing having its sides and top spaced from the sides and top of the outer casing and having a top opening in register with top opening of the casing and a tube connected thereto about its opening and extending to the opening in the casing, to provide a closed brine space extending about the sides and the top of the storage chamber, and a refrigerating coil located in the portion of the brine space above the chamber.

1,929,176. SYSTEM OF AIR CONDITIONING. Frank T. Leilich, Baltimore, Md., assignor, by mesne assignments, to William W. Varney, Baltimore, Md. Application Dec. 24, 1930. Serial No. 504,514. 6 Claims. (Cl. 261—11.)

1. The process of air treating consisting of, treating a body of moving air to change its condition as to temperature and humidity as a first stage treatment, then dividing said air for individual treatment of said divided parts and then treating one of said parts to change its condition as to temperature and humidity with reference to the other part of said divided air, then mixing with one of said divided portions initial air to be delivered with said divided portion separate from the other divided portion.

1,929,282. AUTOMATIC CONTROL FOR ABSORPTION REFRIGERATORS. Wilbur G. Midnight, Cleveland, Ohio, assignor to Perfection Stove Co., Cleveland, Ohio, a Corporation of Ohio. Application March 7, 1932. Serial No. 597,205. 40 Claims. (Cl. 62—5.)

1. Absorption refrigeration apparatus comprising a rigid stationary system of intercommunicating vessels and conduits,



one of said vessels constituting the generator, means for heating the generator, and an automatic control therefor that is subject to the action of the liquid in the generator end of the system and is caused to function to render the heating means ineffective by reason of the liquid level in said end of the system falling below a predetermined elevation.

FINANCIAL STATEMENTS

CHICAGO—Net earnings of $20,113 for the fiscal year ended July 31, 1933 were reported for the General Household Utilities Co., manufacturer of Grunow refrigerators and radios, at the annual meeting of stockholders here last week.

Ratio of current assets to current liabilities is approximately three to one, it was reported, while net working capital totals $1,871,000. Current assets are $2,853,254, compared with current liabilities of $982,968. Cash and United States Treasury certificates of the company are valued at $1,202,218.84.

CLASSIFIED

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POSITIONS WANTED

REFRIGERATION Engineer - Salesman; Age 35. Six years experience with record for getting business and producing profit. Knowledge of Air Conditioning, Beer Cooling and Dairy Equipment, etc. Qualified Frigidaire "F.C.M."—1932-1933, also "B. T. U." Club. Desires change to some city over 100,000 population, representing manufacturer or distributor. References exchanged. Box 595.

EQUIPMENT FOR SALE

YORK, LIPMAN and ORIOLE Ammonia Plants for sale cheap. Also re-conditioned float, flapper, liquid and suction valves for Frigidaire at half price. Special brass fittings, etc. at bargain prices. Let us know your needs. Automatic Refrigeration Exchange, 410 S. Washington Ave., Scranton, Pa.

INDEPENDENT SERVICE COMPANIES

HALECTRIC Thermostat repair service, Ranco, B & B, Two dollars each, one year guarantee, prompt service. Halectric Laboratory. 1793 Lakeview Road, Cleveland, Ohio.

MISCELLANEOUS

A LARGE Wholesale Jobber all makes repossessed refrigerators desires to make contact with distributors throughout the United States. Profits large, investment small. Lifetime opportunity to service men, hardware stores, radio stores, furniture stores and refrigerator dealers as a drawing card for increased business. Box 594.